GEOGRAPHY,
RESOURCES & INDUSTRIES

September, 1945

EDISON ELECTRIC INSTITUTE BULLETIN

SEP 28 1945

Electric Power to Arm the Nation for War . H. S. BENNION 245

On Liberty . . . . . E. W. GUSHEE 248

How Are We Doing With the Customer? . . W. E. STURM 249

Postwar Lighting Markets as Shown by Various Surveys . . . 251

Future of Industrial Lighting 255

744 Out of 745 Say—"Electric Service Is Good" 257

A Public Utility Credit Policy . . . . . GORDON ROSS 258

Way Back in '14 260

Personnel of E.E.I. Committees for 1945-1946 261

Artificial Respiration . . . . . W. R. SMITH 270

Recent E.E.I. Publications 271

Personals 273

E.E.I. Publications and Service Material 275

PUBLISHED MONTHLY BY EDISON ELECTRIC INSTITUTE

THE ELECTRIC LIGHT AND POWER INDUSTRY

Current Statistical Data Covering 100 Per Cent of Industry

June, 1944 and 1945

SOURCE AND DISPOSAL OF ENERGY—MONTH OF JUNE

	1945	1944	%
GENERATION* (Net)			
By Fuel Burning Plants	11,855,717,000	12,304,518,000	− 3.6
By Water Power Plants	6,976,774,000	6,290,148,000	+10.9
Total Generation	**18,832,491,000**	**18,594,666,000**	**+ 1.3**
Add—Net Imports Over International Boundaries	173,325,000	142,622,000	+21.5
Less—Company Use	118,333,000	138,570,000	−14.6
Less—Energy Used by Producer	127,102,000	271,589,000	−53.2
Net Energy for Distribution	**18,760,381,000**	**18,327,129,000**	**+ 2.4**
Losses and Unaccounted for	2,155,659,000	2,076,155,000	+ 3.8
Sales to Ultimate Customers	**16,604,722,000**	**16,250,974,000**	**+ 2.2**

CLASSIFICATION OF SALES

NUMBER OF CUSTOMERS—As of June 30th			
Residential or Domestic	27,828,587	27,175,077	+ 2.4
Rural (Distinct Rural Rates)	1,177,196	1,138,781	.....
Commercial or Industrial:			
Small Light and Power	4,311,459	4,214,985	+ 2.3
Large Light and Power	154,832	150,041	
Other Customers	117,996	117,528	+ 0.4
Total Ultimate Customers	**33,590,070**	**32,796,412**	**+ 2.4**
KILOWATTHOUR SALES—During Month of June			
Residential or Domestic	2,656,143,000	2,422,425,000	+ 9.6
Rural (Distinct Rural Rates)	402,650,000	371,495,000	+ 8.4
Commercial or Industrial:			
Small Light and Power	2,478,341,000	2,453,513,000	+ 1.0
Large Light and Power	9,614,402,000	9,641,220,000	+ 0.0
Street and Highway Lighting	146,328,000	144,550,000	+ 1.2
Other Public Authorities	656,141,000	614,445,000	+ 6.8
Railways and Railroads:			
Street and Interurban Railways	357,545,000	349,985,000	+ 2.2
Electrified Steam Railroads	216,394,000	212,124,000	+ 2.0
Interdepartmental	49,778,000	41,217,000	+20.8
Total to Ultimate Customers	**16,604,722,000**	**16,250,974,000**	**+ 2.2**
Revenue from Ultimate Customers	**$277,255,200**	**$268,612,300**	**+ 3.2**

RESIDENTIAL OR DOMESTIC SERVICE

AVERAGE CUSTOMER DATA—For 12 months ended June 30th			
Kilowatthours per Customer	1,186	1,117	+ 6.2
Average Annual Bill	$41.15	$39.65	+ 3.8
Revenue per Kilowatthour	3.47¢	3.55¢	− 2.3

(*) By courtesy of the Federal Power Commission.

Vol. 13, No. 9, EDISON ELECTRIC INSTITUTE BULLETIN; published monthly. Entered as second-class matter Aug. 17, 1933, at the post office at Philadelphia, Pa., under the act of March 3, 1879. Publication office, 56th and Chestnut Sts., Philadelphia, Pa. Editorial office, 420 Lexington Ave., New York, N. Y. Subscription rate $2.00 per year in the United States; $3.00 per year in foreign countries.

The Edison Electric Institute does not assume responsibility for, nor necessarily endorse or approve, statements made by contributors to the BULLETIN.

EDISON ELECTRIC INSTITUTE BULLETIN

Volume 13 SEPTEMBER 1945 No. 9

Electric Power to Arm the Nation for War

By H. S. Bennion

Vice-President and Managing Director, Edison Electric Institute

Presented Aug. 2, 1945 before an Advanced Seminar of the Army Industrial College, Washington, D. C.

IT IS the duty of the War and Navy Departments continually to plan for war. The electric power industry is well aware of the part that industry has to play in arming for war and of its own key position on the industrial team. It is therefore glad to see the Army Industrial College at the present time concerning itself with the study of future wartime power supply.

Sound advance planning always simplifies operating problems when the time of action arrives. It is a safeguard against under-preparation and a safeguard also against panicky overestimates made when trouble threatens, overestimates that use up manpower and materials when they will later be sorely needed for other war purposes. Long range planning should proceed along broad lines and deal only with important considerations. Detailed plans are too much affected by changing conditions.

In roughly sizing up the characteristics of the power situation in World War II, I am going to compare operations in the year 1939 against 1944 because 1938 was a depression year and not as good for a comparison as 1939. Electric power use for war purposes reached its peak in 1944. In 1945 it will not be very different.

Total sales of electric power by the utility industry increased 92 billion kilowatthours from 1939 to 1944, a 90 per cent increase. War uses took about 90 billion kilowatthours in 1944. Increased civilian uses in 1944 over 1939 amounted to about 2 billion kilowatthours.

In addition to the sales of the utility industry, the output of electricity by isolated industrial plants in the same five-year period rose from 32 billion kilowatthours to 53 billion kilowatthours, and about two-thirds of this total went into war uses. Thus we see that war makes a heavy demand on electric power.

I think it will be worth our while to break down the sources or derivation of this power increase in the five-year period to see where it came from and consider how the factors producing it may perchance operate in another war. A very large part of the added kilowatthours were derived from more hours of use of existing generating equipment.

In 1939 the electric utility industry had 40 million kilowatts of installed capacity. If the power systems in 1944 had operated just as they did in 1939, that is, if the average yearly output in kilowatthours per kilowatt of installed generating acapacity had remained the same, if the same ratio between total installed capacity and the sum of the peak load on the power systems had been maintained, and if the ratio of transmission losses had remained unchanged, it would have required about 76 million kilowatts of generating capacity to carry the load on the electric power industry in 1944; whereas the industry in 1944 actually got along with 50 million kilowatts of generating capacity. How is the difference of 26 million kilowatts of generating capacity between the hypothetical need and the actual need to be explained? As already indicated, the industry actually added 10 million kilowatts of generating capacity during the five year period. There follows a rough accounting for the 26 million kilowatt difference.

First, the margin between peak loads and total installed capacity. In 1939 peak loads totaled 29.3 million kilowatts and total installed capacity was 40.3 million kilowatts. In 1944 the peak load for the country was 41.5 million kilowatts and had the 1939 ratio been maintained the total installed capacity would have had to be approximately 57 million kilowatts, though it was actually 50.3 million. (The country did not have occasion to find out how much further this margin could have been reduced before curtailment of some uses of electricity might become necessary in some areas. In most parts of the country much more load could have been carried and if the demand had arisen all spare capacity would have been put to work. It should be noted that the record of outages during the first two years of long-hour operation of equipment and limited maintenance was excellent, but by 1944 and 1945 outages had become more of a problem so that in actual outage and in increased need for spinning reserves due to lessened reliability some 500,000 to 1,000,000 kilowatts of effective load carrying ability were lost to the country between 1942 and 1945.)

Second, the introduction of one hour War Time took off about a million and a half kilowatts from the peak load.

Third, better coordination of interconnected power systems gave the equivalent of about a million and a quarter kilowatts of generating capacity.

Fourth, the percentage of energy losses applying to the increment power sales was only 8 per cent, compared with a corresponding 18.6 per cent spread between total output and total sales in 1939. To sell 92 billion more kilowatthours in 1944 than were sold in 1939 it was only necessary to generate an additional 100 billion kilowatthours. This lower loss percentage had the effect of reducing the need for additional generating capacity by about 3½ million kilo-

watts on the 1939 basis of 3285 kilowatthours per kilowatt of installed generating capacity.

Fifth, adding up these first four items, we derive a total of about 13,000,000 kilowatts out of the 26 million differential, leaving a balance of about 13,000,000 kilowatts. This figure roughly measures the saving in generating capacity attributable to the change in factory operation to two and three shifts per day and six and seven days per week and attributable also to the great expansion in the production of aluminum, magnesium, electric steel and alloys in plants where the annual load factor was as high as 95 per cent. The production of aluminum alone in 1944 took about 16 billion kilowatthours and all electrometallurgy took about 28 billion kilowatthours.

The history of the isolated industrial plants was about the same as the history of the utility industry. They added during the five-year period about 22 per cent of generating capacity and their output rose about 70 per cent, due principally to longer hours of operation per week.

At this point I want to say a word about the value of experience in formulating plans and do a little boasting about the forecasting of the electric utility companies. In June, 1939, when war clouds over Europe were very apparent, President C. W. Kellogg of the Edison Electric Institute, drawing upon the experience of the industry, under the heading "No Power Shortage," said: "Ample generating capacity has been built by electric utility companies to supply all the factories now in existence in this country except those which still manufacture their own power. Until new factories are built, therefore, the increased demand for power in time of war must be largely during the night and the early morning hours, that is, in a higher utilization of existing capacity rather than in any great demand for additional generating capacity." He further emphasized that, "In wartime, procurement plans that would increase the hours of use in factories could easily raise this figure (the average annual production per kilowatt of generating capacity) to 4200 kilowatthours or more." In 1944 this figure actually rose to 4632 kilowatthours per kilowatt of generating capacity.

In other statements, Mr. Kellogg also pointed out that manpower, materials and transport would prove to be the limiting factors before any consequential electric power limitations were encountered.

If the plans and estimates of one government agency had been followed, another 10 million kilowatts of generating capacity would have been in process of manufacturing during the early war period when men and materials for that type of equipment were urgently demanded for building and installing electric power plants to drive the naval vessels and the shipping fleet then being built to prosecute the war. Its manufacture would also have been in direct competition with the equipment sorely needed at that time for the production of synthetic rubber and high octane gas. The electric utility companies understood their business and their estimates proved to be sound. Even their own building program was pared down about two and a half million kilowatts by the War Production Board when it arrived at a determination of the relative order of need for men and materials of the several war activities.

If we examine the factors contributing to increased power output during the war, it is apparent that they may be expected to operate again in another war, though not perhaps to the same degree in every case. Taking up first the addition in the five-year period of 10 million kilowatts of generating capacity by the utility industry and 2 million kilowatts for industrial plants, in the four years from 1941 to 1944 electrical manufacturers who supplied this generating equipment also supplied approximately 30 million kilowatts of electrical generating equipment for propulsion of naval vessels and another 7½ million kilowatts for the propulsion of maritime vessels. Is it probable that again in wartime, America will require so large an increase in naval craft or in shipping? At any rate, the figures I have quoted show enormous manufacturing capacity for electrical generating equipment. The combined production figures amount to 50 million kilowatts and the rate for the last four years is nearly 12 million kilowatts per year.

With respect to item 1, the reduction in margin between total installed capacity and annual peak load by putting more of the reserves or more spare capacity to work, we must assume that by the time another war period comes along system operating practices may have reduced the available margins. The companies in this war found out that they could get along with less margin than had become their practice. Furthermore, large interconnected systems tend to reduce the percentage of spare capacity. They aim to take full advantage of diversity. Nevertheless, the American tendency to have on hand plenty of reserves will surely continue to operate as it did heretofore, and certainly we can count on a fairly substantial margin of reserves that can be used when necessity dictates. Some would argue, as they did when this war broke out, that this reserve should be maintained all the way through the war, but such an argument seems ridiculous. Reserves are created for use in an emergency and if a war is not an emergency then what is one?

In the last analysis, if shortages occur, the result is not fatal to the war effort because customers or part of customers' loads can be dropped according to priority pending restoration of an adequate supply. By way of illustration, when the German breakthrough in the Ardennes cut off Belgian coal mining for a period of several days until a new timber supply could be tapped, coal was cut off for everything except Army transport. Next it was given to the Army for general use, next to civilian transport, then to civilian utilities, then to civilian industry, and finally was made available for civilian general use.

General Arnold last winter forecast that the next World War would start with the bombing of American industry. Undoubtedly such a prospect must concern our study of power supply for future war preparedness. Although I am only partially informed concerning the effect of bombing on power supply in this war, it is my understanding that the war load on the power systems is destroyed approximately in proportion as the power supply system is damaged, and that the power system can be restored as fast or faster than munitions factories and other war loads can be reestablished. In other words, it does not seem justifiable to assume that the power plants will be knocked out with no corresponding cutting down of the loads they will be supplying.

Taking up items 2 and 3, presumably we can again expect some capacity saving through the adoption of War Time. We can also expect some room for improvement in the wartime coordination of interconnected systems; not so much as was accomplished in this war, but with-

out the compulsion of necessity it is to be expected that when systems have comfortable margins of capacity they will drift into the natural habit of using their own resources first before calling on their neighbors for the last notch in combined system coordination.

It has been opined, and I think correctly so, that prior to the next war there will be a much greater use of and much more reliance on electricity in our industrial, commercial and domestic establishments. This, however, will mean the availability of correspondingly greater power resources to meet the changing requirements. If electricity should become widely used for heating purposes, a use which takes enormous capacity, conversion to other types of heating will make available considerable power for war uses.

Next is the question of increased electricity output due to longer hours per week of factory operation. Prior to World War II, when shortened hours per week were the rule in factories, it was the experience of power companies that the demand rose to a maximum only on Tuesday, Wednesday and Thursday. It was considerably less on Monday and Friday and fell off very sharply on Saturday and Sunday. If the work week should be shortened further in future, then the wartime lengthening of hours per week of factory operation will have even more pronounced effect than it had in the present war.

In closing, there are a few observations I would like to inject. With respect to power supply for this war, give the electric utility companies credit for their spirit of cooperation and their performance. They delivered in every department. Give them credit also for the fact that a network of lines had already been built covering most of this country wherever the Army wished to locate its camps and training establishments or its munition plants. The maligned holding company provided the money and the engineering effort for most of these well located and well planned power lines and the adequate power supply that was back of them. This previous accomplishment materially expedited the construction of Army establishments and saved a vast amount of labor and materials when these were badly needed.

Cost of Electric Power

The 1944 bill for all the power supplied by privately owned and government owned public utilities for war purposes was about $900,000,000. Estimating another $350,000,000 for the cost of power for war use produced by isolated, industrial power plants, the total 1944 power cost was about 1.4 per cent of the total war cost for that year of $89,300,000,000, as reported by the Treasury. Although electricity makes a large and vital contribution to the war, its cost is a relatively small part of total war expenditures. Electric utility companies did not receive all of the $900,000,000 referred to, but they paid in Federal taxes $468,000,000.

Security

About security. The old campaigner gets down to bare essentials. The tenderfoot loads himself up with provisions for every possible contingency. There was considerable of that in our security operations in this country as applied to utility companies as well as in other fields of endeavor. It must always be remembered that men and materials are the worst bottleneck in war, and they must always be used sparingly. Unnecessary use is to be avoided.

Cooperation

Finally I want to emphasize a point made by General Eisenhower in two talks in New York City recenty in which he said that a nation must be strong to cooperate: "It is not enough that we devise every kind of international machinery to keep the peace. We must also be strong ourselves. Weakness cannot cooperate with anything. Only strength can cooperate."

This sound observation applies to industrial preparedness. American industry has proved once again that it is the marvel of the world in delivering the goods. It had what it takes in both capability and spirit of accomplishment. As for electric power, ten, twenty, thirty years hence, will there be an adequate supply in case of rearming for war? The best assurance that there will be such a supply will be the existence of a strong, resourceful, experienced, electric industry with a good understanding of the general size and nature of its responsibilities. If, as General Arnold predicted, the next world war will start with the bombing of American industry, the best assurance of being able to carry on in spite of such interference will lie in strong, resourceful industries that can quickly adapt themselves to new situations and contrive to produce in spite of an enemy's destructive attacks. In such situations the spirit and organization of men are far more imporant than equipment and great stores of spare materials.

(Note: The foregoing was written before the announcement of the atomic bomb. This development serves only to emphasize the importance of industrial capacity to wage war and it serves to strengthen the point that the best assurance for industrial preparedness to meet grave eventualities at some uncertain future time is the continued existence of strong, resourceful, experienced industry—keeping private industry and private initiative on the job.)

Submetered Residential Electric Customers Increase by More Than 1,000,000 in Four Years

ON April 1, 1940, there were 27,229,000 occupied residences using electricity, according to the U. S. Bureau of the Census. On that same date, the number of residential and rural electric "customers" totaled 25,805,896, the difference of 2,423,104 representing residences in multiple dwellings served through single meters, and a number of combination homes and stores using electricity on other than "residential" or "rural" rate schedules.

On October 1, 1944, the recent release of the Census showed that 31,922,000 occupied residences were using electricity, against a total number of "residential" and "rural" electric "customers" of 28,435,257, or a difference of 3,556,743. In four and a half years the discrepancy between the electric "customers" and the total number of families using electricity has grown by 1,133,639, representing, in large part, the growth of community housing projects all over the country, each of which purchases current through one single meter.

It thus appears that the standard tabulation of the national total of "residential" electric consumers and its much-quoted averages of annual consumption per customer and average price per kwhr represent only 85 per cent of all homes using service. When it is recalled that no breakdown exists of the use, by homes, of the hybrid classification known as "rural" service, it is evident that there are a the present moment almost 5,000,000 families whose use of electricity and whose payments are entirely conjectural.

On Liberty

By E. W. Gushee

Assistant to Chairman of the Board, The Detroit Edison Company

Excerpts from an article in The Detroit Edison Company *Synchroscope*

LET'S SEE if we can clothe the skeleton of the word liberty with the living flesh of meaning. We have been brought up on the word. It is at the very heart of our concept of democracy. I have taken the Oxford Dictionary and in it I find ten separate but closely related definitions of the word liberty. The meaning about which you and I are particularly concerned today revolves around the political-economic sphere. Let me quote it: "Liberty is the exemption from arbitrary, despotic, or autocratic control—independence, civil liberty." This definition is also one of the meanings for the word freedom.

Political liberty is ordinarily divided into four parts. I should like to divide it into five: (1) Natural liberty, (2) civil liberty, (3) liberty of conscience, (4) liberty of the press, and (5) I add my own, usually included as parts of the others, economic liberty.

Let us look for a minute at some of these kinds of political-economic liberty which I have just listed. Let us think together as to what these liberties really mean to us as individuals. First, let us take the easiest—that is, the class of liberties called liberties of conscience. We all understand what that means pretty well. It means the right to worship in our own particular manner. It means that in things of the spirit we can have our own way. It means that one central power cannot use the medium of the churches to propagandize the people.

The trouble with grasping the real value of liberty is that we have taken these concepts for granted for so long that they have lost their meaning for us. But I contend if we lost our right to worship, even though we may not exercise it frequently, if we lost the right to express ourselves and to act upon our beliefs we should find it a very valuable right. Moreover, we would become aware of the fact that we exercise this kind of liberty more than we now realize.

Now, let us look at civil liberty. It consists of our right to vote, to express our opinions at the polls for the kind of men we want, and it doesn't mean the kind of mockery which attended Hitler elections. It means right of assembly and right to criticize—a most valuable right. And the very right of assembly implies another liberty—liberty of the press, which includes the right of individual expression. When we talk about the liberty of the press, we are talking not only about the liberty of the great papers to print what they please, but also about our right to print pamphlets, to write letters—to give and receive unbiased information.

Then there is economic liberty. Economic liberty is the right of a man to choose his own employment. It is the right of a man to bring up his family as he sees fit. And it is the right of a man to live where and how he wishes within the limitation of his own opportunity and ability, and the luck of the game. It is the right of a man to choose his own career—to be a lawyer, blacksmith, salesman, or electrician. Without this right an individual can be ordered to do the thing which, from some autocrat's view, is for the immediate good of the state—not the individual's good.

If liberty is precious to you and me, we have to do a good deal of serious thinking about it, because liberty can slip away. Before we realize, it's gone. One of the greatest threats to liberty today is the belief (and an honest belief in many cases) that an individual or a relatively small number of individuals can plan the details of everyone's economic life. It is called "planned economy," and when I use the word "planning" I use it in that over-all sense. In other words, a planned economy—Socialism, Nazism, Communism, whatever it is called (they are all of the same type, differing only in detail)—a planned economy has always destroyed human freedom. Liberty, as we have defined it, has been possible only under what we term free enterprise or, better, capitalism.

Historic capitalism is a two-part economic system. But in its essence capitalism is a system of profit and competition. And it isn't capitalism if it isn't both of these things. It is the individual right to develop a market and make a profit, because of the risks run and the sacrifice involved in accumulating capital; and it is also our duty to keep that system competitive. It seems to me, we have had beautiful opportunities in our own country during wartime and in our recent examination of foreign governments to realize the impossibilities of planning for everyone. The job is just too big. The necessity for such planning is one of the horrors of war. It is necessary that during war we lose some of our individual liberties. There are wartime efficiencies in planning when everything must be directed to a single objective. But the inefficiencies, the limitations of planning are none the less evident. War, after all, necessitates dictatorship. Consequently, it is a beautiful illustration of the beauties of liberty and the failures of planning.

Why is it important for us to think about these things? Because if we do not think about them and act upon our thinking, we will lose our freedom. As we lose our sense of the importance of liberty, as it becomes a sound, not a fact —we tend to lean more and more upon central government, each for his own selfish ends, his own security. This does two things: First, it gives a direction toward centralization of government; and second, it gives opportunity to those who, because they have not thought through the problem or because such action will forward their own power, seek insidiously to impose these economic and political changes upon us.

Competition which, as we have seen, is a vital part of the system of free enterprise, becomes the automatic policeman of the system. Without competition, the system is not capitalism and controls must become human controls. I do not believe in the old system of laissez faire—that is, to let alone. Rather competition must go hand in hand with proper legislation, to control human greed. Economic liberty must not become economic license.

As Mr. Dow used to say, if the individual, if the business, knows the law and the interpretation of that law by the courts, both can retain their freedom and do a good job. If, on the other hand, through planning and day-to-day administrative decisions everything is left to the power of an individual to control and regulate, chaos results.

How Are We Doing With the Customer?

By W. E. Sturm
West Penn Power Company

A Joint AGA-EEI Customer Activities Report

WE will all accept as fundamental that customer activities operating practices, procedures and policies should be geared to obtaining efficient, economical work results and, at the same time, maintain and promote satisfactory relations with customers. This dual aspect of customer activities often imposes conflicts. We must not place too much emphasis on abstract clerical and work efficiency if, in so doing, we interfere with accomplishing a good customer relations job. On the other hand, we cannot idealize in the sphere of customers' relations and thus impose disproportionate burdens upon an otherwise efficient operating organization. The problem is one which requires constant attention. We should base decisions upon sound business methods after weighing all factors. A prerequisite is flexibility of thinking and the ability to recognize and resolve these conflicts.

It is not the mere rendering of good dependable service that makes the most friends for a company. If the service is hard to get in the first place; if the customer is a victim of arbitrary policies which he does not understand; if he received a notice that his bill is five days overdue; if a hundred other things tend to strain his relations with the company, he gives scant thought to the physical service he is getting, regardless of how little he may pay for it.

Customers are most interested in the "why" of utility operation. By daily habit, our customers compare us with other merchants in the community: the department store, the druggist, the service station, the corner grocer, or, if you will, the super market. All of them operate along similar lines—those of competitive retail merchants—and the baker who puts the thirteenth doughnut in the dozen gets most of the baked goods business. The customer wants to know "why" utilities must be different from other retail establishments.

Recently a joint AGA-EEI Committee undertook a review of member companies to determine what policies and practices made good customer relations and which created unfavorable customer reactions. Questionnaires were sent to men who are responsible for administering customer accounting, service, and collection policies.

The activities of these groups create many of the customers' questions "Why?" To the employees of these groups is trusted the major portion of the burden of creating and maintaining good customer relations—making the customers enjoy doing business with us: the application clerks, meter readers, collectors, cashiers, billing clerks, repairmen, etc.

This survey was in no sense a customer opinion poll. Instead it was an *employee* opinion poll in which the man on the firing line expressed his opinions.

Among the replies to the questionnaire were listed 26 policies and practices which make friends for the Company while 30 were looked upon as a source of irritation to customers. Obviously no one company operates under *all* of the policies and practices on the "Customer Dislike" side of the ledger. Neither can any one company claim that it is doing all of the 26 things that employees say the customers like.

The replies may be outlined as follows:

CUSTOMERS LIKE US WHEN WE:

Maintain a friendly and helpful collection policy.

Provide adequate neighborhood pay bill facilities.

Have a policy of periodically allowing forfeited discount to customers who regularly pay within the discount date.

Arrange to transfer unpaid items for service rendered at former address to customer's new address and bill with service used at the new address.

Are liberal in adjusting for leaks or grounds occurring on customers' premises.

Conduct an intelligent and thorough investigation of high bill complaints and other matters by trained representatives.

Allow on the following day discounts for bills due on holidays.

Base collection activity on a selective process as determined by customer performance.

Check on high consumption for billing.

Refund deposit when reasonably good record has been established.

Make services quickly and easily available through adequate personal and telephone contact facilities and elimination of red tape.

Have available sufficient customer records for quick and ready reference in answering inquiries.

Leave electric services "hot" and available for new customer.

Turn on services without delay for credit check.

Provide prompt emergency service.

Adjust appliances promptly.

Renew fuses without charge.

Maintain free shop services for connecting appliances, adjustments and minor repairs, disconnecting and reconnecting to facilitate redecorating or remodeling.

Give customer a courteous reception—personal—telephone—mail.

Have employees who are efficient, courteous, friendly and properly trained and with sufficient authority to handle the largest number of customers to a conclusion.

Maintain one stop service for customer on ground floor of general office.

Separate personal and telephone contact points so that one does not interfere with the other.

Separate customers' work from all other types to avoid delay in service to customers.

Send personal letter to each new customer.

Participate wholeheartedly in civic and trade activities.

Use "customer inquiry" cards to review customers' attitudes.

CUSTOMERS DISLIKE US WHEN WE:

Read meters on other than a monthly basis.

Render incorrect bills (billing error resented most of all).

Average or estimate bills.

Have rigid policy of refusing to allow discount after due date.

Accept payments at net on mailed remittances with postmark of due date but received a day or two later, and not allowing customers to pay net where they personally present the bill at the same time mailed remittances are received.

Issue delinquent notices on all accounts owing certain amount regardless of credit record.

Forfeit discount on bills when customer claims no bill received.

Threat to withhold for 24 hours or longer the restoral of service after cut off for nonpayment.

Refuse to waive discounts or penalties more than the specified number of times indicated in the regular Company policy.

Refuse to recalculate bills upon customer's statement of irregular use of the billing period.

Read meters through garage or cellar windows.

Fail to indicate on bill when readings are estimated.

Fail to offer discount allowances.

Do not have a grace period in postmark determination of discount earning.

Decline to accept payment if service is to be cut off because of nonpayment.

Place limitations on pay station collections (no arrears bills, no part payments, etc.).

Eliminate field Collectors after it has become standard practice.

Fail to use customers' readings "as provided" for reading bill but use them as a basis for estimate.

Use postal card or other type of billing with symbols not understandable to customers.

Transfer arrears or credits from closed to active accounts without explanation.

Have inflexible payable dates making it impossible for customer to select a date most convenient for him to pay.

Require deposits from all tenants regardless of record.

Require customers to bring small appliances to office for repairs.

Make reference to "company rules."

Have contact employees who are not adequately trained.

"Chase customer around" either when making a personal call at office or by telephone.

Have unnecessary "red tape" in dealing with customer.

Indicate a lack of interest in customer.

The above may be classified according to "Likes" and "Dislikes" as follows:

	Likes	*Dislikes*
1—Billing and Collection	10	21
2—Security Deposits ...	1	1
3—Contracts and Applications for Service ..	4	2
4—Employe Training ..	3	3
5—Company Organization	3	2
6—Miscellaneous	6	1

The headings, "Employee Training" and "Company Organization" have been used to designate policies and procedures that can be improved through either training or organization without actually altering specific policies. For example, customers do not like "Lack of Employee Interest" and "Reference to Company Rules" but they like an organization set-up which permits "one-stop service on ground floor of general office" and "separation of personal and telephone contacts."

As you might expect, considering the group of employees to whom the questionnaire was directed, together with the realization that the customer's closest contact with the Company results from payment of bills, the bulk of both favorable and unfavorable comments on utility practices is centered around billing and collections. In general, the comments do not cover major policies but relate mostly to details involved in the overall administration of the policies. It is, of course, recognized that many of the irritating details can be eliminated only by a major change in policy.

Unfortunately there are more billing and collection policies that are disliked by customers than there are policies which make customers like us. One of the frequently mentioned subjects of criticism is that of discounts or penalties, which scores six unfavorable policies against only two favorable. The two favorable votes relate to a liberal interpretation of the discount or penalty rule.

In the field of security deposits and contracts for service, the questionnaire again emphasizes that customers generally do not like rigid contract requirements and deposits and praise companies who make it easy for them to get service.

Some Rules of Good Conduct

The results of the questionnaire can be summarized best by setting down some rules of "good conduct" which will help to improve customer relations—make the customer like to do business with us.

1. Make it easy for the customer to get service by eliminating "red tape."

2. Accept telephone requests.

a. Leave electric meters "hot"—available for a new customer.

3. Accept most accounts without security deposits.

a. If under certain conditions deposits are necessary, refund them as soon as customer establishes credit.

4. Make bills as understandable as possible.

5. Avoid estimated bills where practicable.

a. In spite of the apparent success of various wartime meter reading plans, many customers dislike anything but monthly meter reading and billing.

6. If you must have a discount or penalty in your rate, be liberal in your waiving of discounts for the customer who is only late occasionally in the payment of his bills.

7. Provide ample facilities for the payment of bills: collection agents, drop boxes and the like.

8. Be selective in the treatment of delinquent accounts. Avoid the practice of issuing delinquent notices on all overdue accounts regardless of credit record.

9. Render prompt emergency service to customers' facilities.

10. Train your employees to be efficient, courteous, and friendly; give them enough authority so they may handle the entire customer transaction. Don't give the customer "the run-around."

11. Keep checking your score to see how you are doing and what your customers think of you.

To Check on Progress

Here are some things that member companies do to check on their progress:

1. An *"independent audit"* of customer attitudes through a systematic interview of selected customers by an employee not regularly contacting these customers, or by an outside agency, is a valuable check on the information obtained through the regular channels of the organization.

2. *Serious scanning of mail* with Customer Attitude in mind.

3. *Periodic surveys and studies* of those phases of work which, from observation, require improvement.

4. *Close check on changes* in procedure to learn customer reaction.

5. *Analysis of complaints,* so that steps can be taken to correct or eliminate causes.

6. *A good Receptionist* in office to see that those coming in aggrieved get to right person and go out satisfied.

7. *Observation* of customers leaving

(*Continued on page* 254)

Prospects for Postwar Lighting Development

Postwar Lighting Markets as Shown by Various Surveys

This discussion is a chapter from Section VI—Postwar Lighting Markets—of the Postwar Planning Report of the Commercial Planning Committee of the Edison Electric Institute.

INDIVIDUALS, organizations and trade publications in all sections of the Lighting Industry—Utilities, Manufacturers, Wholesalers, Contractors and Dealers—indicate a nearly unanimous opinion that the prospects for lighting development and sales in postwar will be the greatest in the history of the industry.

This opinion is based upon many factors:

1. Reduction of consumer purchases since early in 1942 due to suspension of manufacturing of all equipment except that essential to the war effort has built up a substantial backlog of prospective new business;
2. Dimout and brownout restrictions focused public attention to the part lighting plays in everyday normal business and living as nothing else could have done;
3. The exposure of millions of war workers to improved lighting in war plants should result in demand for better lighting in homes, schools, and offices, as well as continuation of good lighting in peacetime commercial and industrial operations;
4. Business organizations of all kinds will modernize in anticipation of the great business boom predicted for several years after the war;
5. Finally, lighting is the one application in the electrical industry that can and should be ready immediately upon conclusion of the war.

This latter conclusion is derived from a recent canvass of a large percentage of lighting equipment manufacturers who stated that they would be ready for immediate full-scale peacetime production —only two exceptions would require three and six months' time. On the other hand, in this same canvass manufacturers of electrical appliances indicated six months for small appliances and 12 to 18 months on large appliances would be required.

Numerous surveys covering various phases of the postwar lighting market have been made by interested groups. Results of some of these surveys follow. Due caution should be be exercised in basing any plans on these survey results, since such results depend to a great extent on how the survey questions were phrased, the conditions under which the survey was conducted and the desire for, but lack of use experience from the users standpoint.

Prewar Versus New Designs of Equipment

What the situation in this connection will be is a determining factor in utility planning for postwar promotion, advertising, selling methods, sales personnel and sales training. The *Electrical World* survey of lighting equipment manufacturers indicate the following:

1. Some pre-war designs will be made, but many changes and new designs are contemplated shortly after the war with eventual gravitation toward a combination of the best pre-war and war-time designs. New designs in fixtures, more definitely functional, are in prospect.
2. Nearly all manufacturers expect to improve their lines by additons to the better pre-war numbers. Several formerly exclusive residential fixture manufacturers expect to enter the commercial and industrial lighting fields. Complete lines of residential fluorescent fixtures have already been designed for post-war by a few.
3. Very few of the war substitute materials are expected to continue in use. Only those that have proved superior to pre-war materials will stay.
4. Light metals, aluminum particularly, and plastics will increase in application.
5. There will be a wider range of types and sizes because buyers' demands will be more diverse. On the other hand, strong efforts will be made by the manufacturers to standardize for volume production for economy's sake.

HOME LIGHTING

Home of Tomorrow

Residential customer-buying expectations and preferences on future home lighting are indicated in the nationwide "Home of Tomorrow" contest conducted in 1944 by *McCall's Magazine*. Readers were asked to submit an essay of at least 200 words to qualify for prizes in each of four contests covering the living room, dining room, bedroom and kitchen. In all, 31,143 women from all sections of the country, representing a comprehensive survey of homemakers, participated. (See summary on next page.)

Kind of Postwar Home

The National Homebuilders Bureau *Small Homes Guide,* with a circulation of 300,000, conducted a survey of its readers under the heading, "Tell Us What Kind of Postwar Home You Want."

The section pertaining to lighting consisted of 24 specific lighting features on which the reader was asked, "How Many of These Lighting Features Do You Want in Your Future Home?" In order of mention the replies produced the following information, although this listing is not to be interpreted as first choice, etc., since the questionnaire gave no opportunity to express order of preference:

84% want a front door light or lights with illuminated house number.
78% want fluorescent tubes each side of the bathroom mirror.
67% want closets lighted.
58% want good lighting over the kitchen sink.
57% want a kitchen center ceiling fixture giving good light.
52% want outside garage and yard lights.
50% want food preparation areas and under cabinets well lighted.
48% want stairs and steps well lighted for safety.
45% want good basement lighting over work bench.
44% want plenty of well diffused light for dressing tables.
42% want good lighting of garage interiors.
49% want better sight lamps where close eye work is done.
41% want good lighting in the laundry.
41% want good lighting over mirrors.
38% want a well lighted game room.
37% want good lighting over the bedhead.
34% want an individual light over the cooking range.
33% want a baseboard night light in bedrooms.
30% want a health lamp for the nursery.
29% want a Better Sight Lamp at the sewing machine.
29% want a well lighted dinette to provide for study.
27% want wall-type lighting over sofas for comfortable reading.
22% want central lighting in the living room.
19% want a special card table lamp.

Of special note in this survey is that among the higher percentage desires are many applications which are old to the industry but of which customers apparently have been deprived because of ignorance, indifference, or economies in wiring on the part of small home builders.

SUMMARY OF REPLIES RECEIVED TO McCALL'S MAGAZINE "HOME OF TOMORROW" CONTEST

Living Room Contest - Lighting

(12,000 women entered; varying number expressed preferences on various types of lighting)

Type of Lighting	No. Answering	I Don't Like	I Have Now	I Like-May Get	I Must Have
Central Fixtures	11,619	6987-60.1%	3015-25.9%	891- 7.7%	726- 6.3%
Wall Brackets	11,441	6362-55.6%	1673-14.6%	2435-21.3%	971- 8.5%
Built-in Lights over windows	10,921	5292-48.5%	278- 2.5%	4102-37.5%	1249-11.4%
Fluorescent Lighting	11,426	3508-30.7%	282- 2.5%	4753-41.6%	2883-25.2%
Table Lamps	11,564	19- 0.2%	4205-36.4%	1783-15.4% (1-5 or more)	5912-91.0% (1-5 or more)

(Last column does not add to 100% - some women checked more than one item.)

Significant trends; Minimum of interest in central fixtures and wall brackets; fair market promise for built-in lights over windows; definite prospects for some kind of fluorescent lighting; continued popularity of portable lamps is very evident.

Dining Room Contest - Lighting

(11,181 women expressed their preferences as to lighting fixture styles as follows:)
4484 - 40.1% - for flush-with-ceiling type (concealed light source)
3898 - 34.9% - for conventional chandelier
2799 - 25.0% - for fluorescent ceiling unit

The postwar market for new equipment here is indicated by 9,765 women as follows:

Type of Lighting	No. Answering	I don't Like	I Have Now	I Like-May Get	I Must Have
New Central Fixtures	9,765	2931-30.0%	3116-31.9%	1586-16.3%	2132-21.8%
New Side Brackets	9,114	5707-62.6%	970-10.6%	1773-19.5%	664- 7.3%
Built-in Lighting	9,258	3319-35.8%	454- 4.9%	3377-36.5%	2108-22.8%
Fluorescent Lighting	9,327	3787-40.6%	430- 4.6%	3524-37.8%	1586-17.0%

Kitchen Contest - Lighting

Do you think a central lighting fixture necessary in the kitchen?
11,295 Answering
7759-68.7% - Yes
3536-31.3% - No

Where do you consider supplementary lighting important?
11,301 Answering

Over sink	9932-87.9%
At range	8684-76.8%
Over counter	7812-69.1%
Over eating area	1016- 9.0%
In ironing area	86- 0.8%
All other	1407-12.5%

Would you like to install fluorescent lighting in your kitchen?
10,290 Answering
7995-77.7% - Yes
2295-22.3% - No

Bedroom Contest - Lighting

Is there a ceiling light in your bedroom?
10,471 Answering
8345-79.7% - Yes
2126-20.3% - No

On Portable Lamps
9,928 Answering
2808-28.3% - Must have and will buy as soon as possible.
2090-21.1% - Like and may get but not sure.
4573-46.0% - Have now - don't need - won't buy.
457- 4.6% - Don't like and won't buy.

(The report indicates that the reactions to the desirability of a ceiling fixture in this room were not requested.)

Equipment Sales

The Westinghouse Lamp Division conducted a nationwide survey requiring a six-months period. A great many sources both within and without the lighting industry all over the country were contacted. The data secured were checked and double-checked so that they represent a composite picture of the best factual information available on past performance as well as a carefully projected expectation of the future.

The residential share of the lighting industry market of tomorrow, as indicated by the Westinghouse survey, will be a $150,000,000 slice of the $500,000,000 annual total business predicted for the entire industry. This is almost triple the amount, $48,000,000, at which the residential market was evaluated in 1942 when total for the industry was $400,000,000.

Empty Sockets

General Electric surveys indicate that about 17 per cent of residential sockets are now empty (1940 average—10 per cent). Taking the generally-accepted assumption of 26 sockets average per home, this means an average of 4.42 "revenue robbers" per home throughout the country. Thus, with an estimated twenty-eight million wired homes in the United States there is a ready market for nearly 125 million lamp bulbs for replacement purposes in the immediate postwar.

According to General Electric Company the lighting load picture of the average home in 1940, as compared with the average "light-conditioned" home, is as follows:

Average Home

Number of lamp sockets	26
Watts per lamp socket	48
Number of empty sockets	2.6
Number of portable lamps (Wall, Table and Floor Lamps)	7
Number of fixtures	12
Connected lighting load (kw)	1.25

Average Light-Conditioned Home

Number of light sockets	43
Watts per lamp sockets	75
Number of empty sockets	—
Number of portable lamps	16
Number of fixtures	20
Number of specialty items	4
Connected lighting load (kw)	3.4

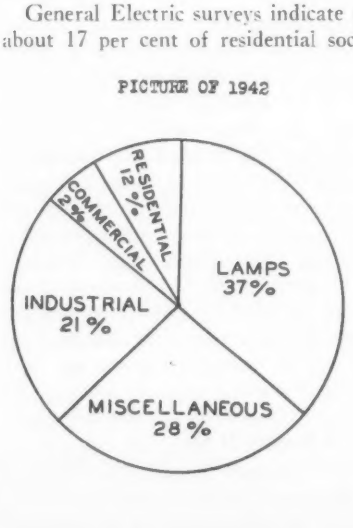
The weighted average lighting load per 1000 homes in 1941, according to GE, was 1225 kw. (10 per cent of the homes—those in the lowest income group—had only 40 per cent of this average connected lighting load, GE studies show.)

While the goal of 3400 lighting kw per 1000 homes seems a rather ambitious one, it offers a postwar target at which every utility may well aim.

New Homes

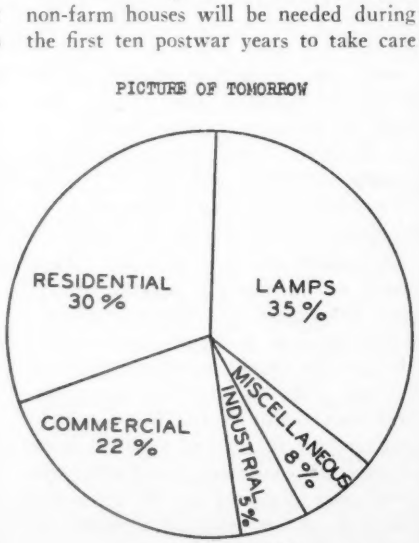
An annual production of 1,250,000 non-farm houses will be needed during the first ten postwar years to take care

PICTURE OF 1942



$400,000,000

PICTURE OF TOMORROW



$500,000,000

of new families, returning veterans, families now living "doubled up," and to replace half of the clearly substandard housing in the country, according to a statement made March 8, 1945, before the Builders Association of Metropolitan Detroit by John B. Blandford, Jr., Administrator of the National Housing Agency.

Just what part of this needed housing will be actually built, and when, are question marks, of course. However, all indications point to a building boom as soon as wartime restrictions are lifted. Housing will get first call, according to reliable authorities. Of the houses built, the proportion that will be adequately wired and properly lighted is a matter that comes well within the realm of utility influence and opportunity.

COMMERCIAL LIGHTING

The surveys reviewed indicated that the trend in postwar commercial lighting is toward fluorescent lighting particularly in stores and offices which make up a very large percentage of this field.

A recent indication of opinions and direction of the thinking of many architects and professional designers, is the combined use of fluorescent and incandescent light sources utilizing the superior advantages of each.

Throughout the country, retail dry goods stores alone plan to spend at least a billion dollars for postwar expansion and improvement with nearly 60 per cent of them stressing new lighting, according to a recent survey by the National Retail Dry Goods Association.

Store and Office Survey

The Duquesne Light Company, Pittsburgh, conducted a personal survey of stores and offices of all kinds and sizes in 45 business districts in Western Pennsylvania, including Pittsburgh.

The results of their survey indicate that the fluorescent fixtures now installed are operating satisfactorily and that the users are satisfied with their fluorescent lighting, and that those using fluorescent would recommend it to others in the same line of business.

Half of those who do not have fluorescent lighting now will buy when fixtures are available again, and a large majority of these customers indicated they would install these fluorescent fixtures for general lighting. Four hundred and sixty one customers indicated that they would buy a total of 2,558 fixtures, an average of 5½ fixtures per customer. These 461 customers now have an average of 5.7 filament fixtures each. It was indicated that $20 was considered the average price they were willing to pay for a fluorescent fixture. When advised of the cost of a 50 foot candle job, 42 per cent of those questioned indicated that because of the cost they would not install lighting of that caliber.

As a guide to future planning, it is interesting to note that 36 per cent of those surveyed who have fluorescent lighting now obtained their lighting information by looking at other installations; 18 per cent consulted the Utility Company; 16 per cent the wholesalers, and 12 per cent their electricians. A large majority admitted that some one had tried to sell them fluorescent lighting and likewise admitted that they would need assistance in selecting a fluorescent system.

The Duquesne survey showed that the average decrease per store was 276 watts where fluorescent lighting was installed. Window lighting was reduced on an average of 644 watts per customer but case lighting averaged 250 watts gain per customer. Nearly one-half of those customers interviewed believed that the installation of a fluorescent job would result in a reduction of their electric bill.

The electrical contractors surveyed indicated that they would recommend fluorescent practically throughout for stores, schools, and offices.

If the results of the Duquesne Light Company survey reflect conditions and the thinking of the country as a whole, it is evident that any substantial job in the commercial lighting field will have to be done by utilities, manufacturers, wholesalers, and contractors cooperating on a program that aims at levels far beyond the customers' present thinking.

Utilities in particular must review their previous operations in the commercial field and recognize that during a mass change-over period they must have a promotional and educational program of a magnitude exceeding anything in the past, backed up with sufficient manpower, if they expect to influence many of the jobs. Unless such a program is established they may find that the great majority of the stores have simply doubled their lighting intensities with the same or less wattage, and then years will have to be spent raising the levels from the new base, as most customers will be loath to change their comparatively new equipment.

Electricity Requirements

The Philadelphia Electric Company has been conducting a survey in order to arrive at a determination of probable postwar electricity requirements. The following information on 9,689 small commercial and industrial customers has been compiled:

The effect of the war on the businesses of these customers was helpful in 2,740 cases (30 per cent) and hurtful in 6,618 (70 per cent).

Lighting intensity is under ten footcandles in 7,548 cases (80 per cent) and over ten in 1,941 (20 per cent).

Practically all customers (97 per cent) observing wartime lighting restrictions will return to normal usage.

It is figured that these 9,689 customers now need additional service totaling:

3,759.1 kw for lighting
1,031.9 kw for exterior signs
121.3 kw for interior signs
522.1 kw for ventilation
472.3 kw for air conditioning
452.9 kw for heating
1,884.1 kw for cooking

The Boston Edison Company, recently completed a survey of postwar potentialities in the lighting field covering existing dwellings, stores, etc., and exclusive of new homes and other new buildings.

Estimates of new lighting are:

Bulbs	$1,800,000
Home Lighting Equipment	272,000
Commercial and Industrial Lighting Equipment	1,250,000
Total	$3,322,000

The nationwide survey by the Westinghouse Lamp Division previously referred to covers both the Commercial, Industrial, and Street Lighting Postwar Lighting Markets. The results of these surveys are reported in the July 22, 1944 issue of *Electrical World*. These surveys are well worth utility study.

SCHOOL LIGHTING

Postwar Products Contemplated

One of the distinctive differences in postwar school buildings will be the more extensive use of fluorescent lighting. According to the returns of the survey made by *The Nation's Schools* among 6,300 school systems of 500 enrollment and over, to determine the type of postwar products now contemplated, 71 per cent of the schoolmen who replied will use fluorescent lighting as compared with 51 per cent who will use incandescent.

This adds up to more than 100 per cent but this is due to the fact that some

schools will use one type in certain departments and the alternate type in other departments. This is probably the most logical answer to the problem of lighting as each type has certain advantages. On the other hand, architects appear to be less impressed by fluorescent lighting than the superintendents as only 52 per cent indicate an intention of using any fluorescent while 74 per cent favor incandescent.

Indirect and Semi-indirect Fixtures Preferred

When incandescent lighting is to be used, it will be employed in a somewhat different fashion from that used formerly, for the indirect and semi-indirect fixtures are each accorded preference by 40 per cent of the schoolmen while the standard enclosed globe type receives the remaining 20 per cent of the votes. As the indirect and semi-indirect fixtures give greater light diffusion and less glare than the ordinary enclosed globe design, these preferences are in keeping with the recommendations of the best authorities on school lighting. An appreciation of the need for keeping the direct light source out of the field of view is also apparent in the fact that schoolmen have favored by 3 to 1 covered fluorescent lamps over exposed lamps. The architects concur. Most of these interested in fluorescent lighting would like to have the equipment mounted at the ceiling level or recessed therein. About half as many, or 30 per cent of all, favor the pendant type of fluorescent fixture while the remaining 11 to 12 per cent are interested in a coved installation on the sidewalls near the ceiling. There is something to be said for all these methods of installation as yet there has not been a sufficient accumulation of experience in schools to make any one of them an obvious choice over the others. New developments are still being made.

Automatic Control Appeals

As most schoolmen and architects know, there has been on the market for several years an electric eye device which automatically switches the artificial light off and on whenever the footcandles of natural light rise or fall below a certain predetermined level. This apparently has some definite appeal to the schoolmen for 70 per cent of them indicate that they consider it desirable equipment.

With schools being used more and more as community centers, it is not surprising to find that 25 per cent of the schoolmen and 36 per cent of the architects feel it is desirable to provide an emergency or standby lighting plant for the auditorium. Almost as many—20 per cent of the schoolmen and 26 per cent of the architects—consider it desirable for the gymnasiums and only a slightly smaller number would like to have such emergency service for the corridors. In some states this is required by the school building code under certain circumstances. It is a safety precaution that should at least be considered by all schools having auditorium and gymnasium seating capacity of 200 or more.

More Base Plug Outlets Needed

Comparatively few existing schools were provided with enough electric base plug outlets when originally built. This has been a deterrent to a more widespread use of the many mechanical audio-visual aids, such as still-projectors, motion picture projectors, recorders, radios and record players, that will occupy an increasingly important place in postwar education.

The newer schools, however, are going to want them, with 90 per cent of the superintendents planning to have two or more such outlets in each classroom. A fairly recent development has been a continuous base outlet so that the plug of any electrically operated appliance can be hooked in anywhere along the base. A majority is interested in this.

Interest in Germicidal Lamps

Another rather recent development is the germicidal lamp for the elimination of airborne bacteria. There still seems to be some question about the efficacy of such installations in areas as large as classrooms, but 46 per cent of school administrators and 36 per cent of the architects are considering the use of them in toilet rooms. That they might be effectively used in locker rooms, infirmaries and clinics is evidenced by the fact that 39 per cent of the schoolmen believe they could be used in the first named location, 19 per cent in the second, and 20 per cent in the third.

Conclusions That May Be Drawn from These Surveys

The market for increased lighting in all fields of application immediately after the war is over and for a sustained period thereafter is extensive—probably the greatest the lighting industry has ever had.

Fluorescent lighting will predominate the commercial and industrial fields. It is established with and is wanted by the majority of customers in these classifications.

In the residential field fluorescent lighting progress will be slow for general use. In certain rooms of the home—kitchen and bathroom—customer acceptance will be more rapid.

If fullest advantage of the immediate market opportunities is taken the lighting departments must be prepared with sufficient man and woman power to educate, promote and sell.

If 2500 to 3000 was the lighting personnel of all utilities before the war, indications are that three times that number should be put to work immediately after the war is over.

Lighting employees will need a thorough training to take fullest advantage of sales opportunities and to promote quality lighting as well as quantity lighting. If the "hit and miss" methods of training largely employed in the past are to be revived, the results will continue to be far below the potentialities.

The time to prepare a lighting program—set up a training program and build up a lighting organization is—NOW.

How Are We Doing?

(*Continued from page* 250)

cashiers or customer service departments.

8. *Listening* on telephone or face-to-face conversation.

9. *Have employees report* criticism or praise.

10. *Encourage employees to make suggestions* and submit ideas that will improve service.

11. *Group conferences* of contact employees are helpful in learning customer attitude.

12. *Keep informed* as to practices adopted or discarded in the utility field.

The Committee realizes that the survey is a limited one and it is not intended to accomplish other than to lay some groundwork for a consideration of some of our policies and practices. There is no absolute "right" or "wrong" way; conditions and circumstances often are controlling factors. We should like to see a more specific study made of certain of the policies and practices. Certainly they offer a profitable field for development.

Future of Industrial Lighting

This discussion is a chapter from Section VI—Postwar Lighting Markets—of the Postwar Planning Report of the Commercial Planning Committee of the Edison Electric Institute

A DISCUSSION of the place of industrial lighting in the plans of electric utilities requires a careful evaluation of many factors. Complete analysis must be made of the following three stages in the development and progress of industrial lighting:

1. Prewar lighting,
2. Wartime lighting, and
3. Postwar lighting in industrial areas.

By studying and classifying known facts with respect to prewar and wartime industrial lighting and obtaining as much information as possible on postwar business developments, some conclusions can be drawn regarding the future of industrial lighting.

Some of the accepted facts regarding the merits of industrial lighting are: good lighting increases production, promotes safety, and improves employee morale. Surveys show that good lighting has been installed at a cost of only 1 per cent of a concern's payroll and has resulted in increased productivity up to 10 per cent of payrolls. These facts were proved in the prewar period and were actually capitalized on during the war. As a consequence, the general levels of lighting during the war have been raised beyond levels which existed before the war.

In developing a well-defined and sound postwar program we must recognize these facts and their relation to business in general. With governmental cutbacks and contract terminations, industrial executives will turn their thoughts to reconversion and competitive peacetime operations. When normal peacetime production operations are again undertaken, the business which is able to keep its production and distribution costs at a minimum will be the successful one. Obviously, the importance of engineered lighting cannot be ignored by any progressive executive in view of the increased efficiency obtained by many concerns before and after the war. This applies not only to plants converting from wartime to peacetime production, but also to that large group of civilian industries which were unable to obtain priorities for improved lighting during the war.

In addition to the tangible results produced from the standpoint of production and safety, one of the most important factors to be considered is employee morale. Employees are having more and more to say about the conditions under which they work. It is reasonable to assume that modern lighting will be included as one of the first demands of employees. Many war workers have enjoyed the benefits from working under good lighting. Changes to peacetime employment will carry with it a demand for adequate illumination. All of these factors point to the inevitable conclusion that the future growth of industrial lighting is assured with commensurate increases in the use of electrical energy.

In view of the enormous wartime expansion of new industrial construction some of us may feel that the future of industrial lighting will be somewhat limited. Let us for a moment look at this picture from the standpoint of our existing market and our immediate market following the lifting of wartime restrictions. According to the best figures available, 25 per cent has been added to manufacturers' floor space as a result of wartime construction, and the balance of their capacity consists of old buildings, equipment, etc. Undoubtedly, a portion of the old space has been modernized to wartime standards. Some estimates indicate that this modernization is on the order of 15 per cent. Assuming that 15 per cent is a conservative figure and that wartime construction, namely 25 per cent, is well lighted, there remains 85 per cent of our old industrial areas inadequately lighted in accordance with present-day standards. Therefore, with these assumptions, we have to date done less than one-third of the job. What then is our present market?

Our immediate market consists of two industrial groups:

1. Those engaged in war work whose plants have not modernized their lighting;
2. Civilian industries that have not had wartime priorities for material to make changes.

Wartime Industries

When thinking of wartime industries many may question the possibilities of this immediate market. However, two factors should be remembered in planning of future sales programs:

1. New light sources and methods of application have made many present installations obsolete;
2. Changing of manufacturing processes and accelerated production requirements demand new and improved lighting systems.

Civilian Industries

Civilian industries include a large portion of our industrial production. A list of the more prominent ones would include:

1. The food industries, meat packing, dairies, flour mills, dry food preparations, beverages, candy. etc.
2. The civilian clothing industry, shoe manufacture, men's and women's clothing, textiles in general.
3. The very large number of specialty manufacturers, jewelry, trinkets, watch making, etc.
4. The printing and ink industries.
5. Tobacco products.
6. Lumber, plumbing and builders supplies.
7. Automobile and auxiliary manufacture.
8. Paint and varnish industries.
9. Paper and pulp industries.
10. Patent and proprietary medicines.
11. Home appliances.
12. These and many others will have a pent-up demand for better plant conditions and probably the money to satisfy this demand.

These industries have been unable to make even normal improvements in their factories. It has been a question of "How can I keep operating?" rather than "How can I improve my operations?" With the lifting of manpower and material restrictions the industrial lighting market will be much larger than it was before the war. Lessons learned during the war will be used in civilian production and, as a result, a higher lighting market is waiting for development when materials are available.

Evaluating the Lighting Kilowatt

Before attempting to evaluate the future market, let us determine the importance of this lighting load to a public service company. A kilowatt in lighting is used considerably more than a kilowatt in other large loads, such as motors. This was true before the war and has been proved again during the war. And in the postwar period it will still be true.

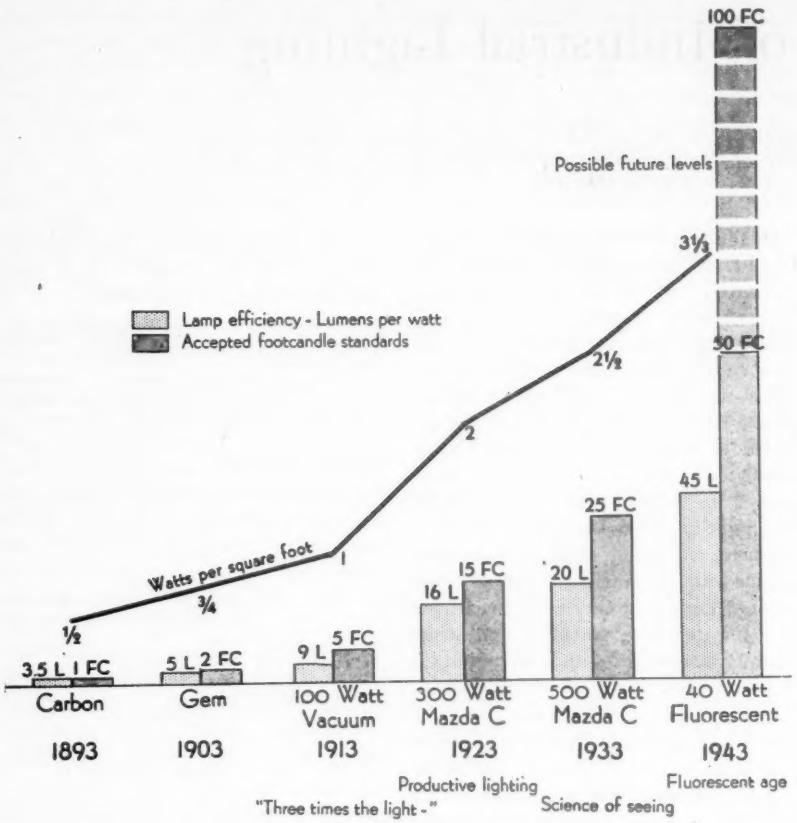


Figure 1

The following analysis of the connected load and the use of that load in nine typical industrial plants confirms this statement for prewar and wartime use:

DIVISION OF POWER LOAD—9 TYPICAL PLANTS

	Prewar			*Present*		
	Kw	*Kwhr*	*Relative Load Factor*	*Kw*	*Kwhr*	*Relative Load Factor*
Total Load*	82,200	10,500	100	164,100	22,000	100
Lighting (% of total load)	16.8	23.4	139	13.3	30.0	225
Motors (% of total load)	72.4	60.3	83	80.6	61.3	76
Heat, Small power tools, Welding, Electro chemical, Air conditioning	10.8	16.3	161	6.1	8.7	126

Note: *Kw represents connected load—not demand. Kwhr are in thousands per month.

From the public service companies' standpoint, the return per connected kilowatt is so much greater for lighting than for other loads that the utility cannot afford to pass up active lighting promotion in the industrial field.

Light Source Efficiency Increases

Many times in the past some people have in the beginning been perturbed at any new improvement in light sources, feeling that the potential kilowatthour sale for lighting would take a tail-spin as a result of an improved light source. Figure 1 has been prepared to correct this erroneous impression.

While it is true that there have been phenomenal increases in the efficiency of light sources from 3.5 lumens per watt of the carbon lamp to 45 lumens per watt for the fluorescent lamp; it is also true that the demand for higher levels of lighting has increased at an even faster pace—from roughly one footcandle in 1893 to 50 to 100 footcandles at present. In order to produce these higher levels of lighting—even with the more improved light sources—there has been an average increase in required connected load from ½ watt per square foot to 3 1/3 watts per square foot (an increase of 666 per cent). This demand for higher footcandles is a result of past experience and activities, such as Better Light-Better Sight programs, etc. We can, therefore, assume that regardless of increasing efficiencies of light sources, kilowatthour increases can be expected in the future.

Having established the need for adequate illumination, its value to public service companies and the future trend of lighting levels, we have some basis for a discussion of future possibilities.

Future Possibilities

In the beginning of this discussion, three important factors were listed; i.e., prewar lighting in industrial areas, wartime lighting in industrial areas, and postwar lighting in industrial areas. How do these factors influence future possibilities? Reliable sources estimate that prewar industrial areas totaled five billion square feet, of which 15 per cent were well lighted. These same sources estimate that one and one-quarter billion square feet were added by the war construction program. These new areas are assumed to be well lighted, leaving 85 per cent of our prewar buildings still inadequately lighted. The question then resolves itself into what portion of these areas will be used in the postwar period and what increase in energy used can be expected if this portion is used.

The extent to which our industrial areas will be used depends upon the demand for manufactured products. Various estimates of this postwar level have been made and for the purpose of this discussion it is assumed that postwar demands will be 40 percent above the 1936-1939 average. If then we consider the prewar space requirements as normal, postwar requirements would be not less than this figure, namely, five billion square feet. Some may wonder about the anticipated 40 per cent increase. For the purpose of this discussion, we will assume that the increase is possible in the same productive space, due to increased operating efficiencies as a result of wartime experience, combined with a plant modernization program. This would mean that one and one-quarter billion square feet of our present floor space would be obsolete in the postwar period. A 40 per cent increase in the same area is not impossible when improved production methods are evaluated.

Using these assumptions as a basis for our future market, we come to this conclusion:

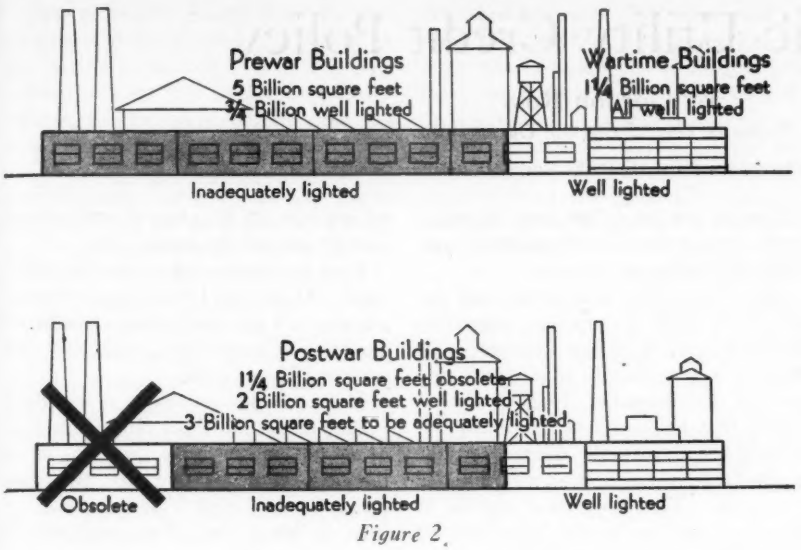


Figure 2.

Present space in use	6,250,000,000 sq. ft.
Wartime construction well lighted	1,250,000,000 sq. ft.
Prewar buildings well lighted	750,000,000 sq. ft.
Total areas well lighted	2,000,000,000 sq. ft.

Assuming that five billion square feet will be necessary for postwar production and two billion square feet are at the present time well lighted, our potential market is then three billion square feet of industrial space inadequately lighted. This is shown graphically on Figure 2.

Having established the areas to be lighted, the discussion of future lighting possibilities breaks down into four headings:

1. Lighting levels
2. Lighting sources
3. Equipment
4. Evaluation of market

1. Lighting Levels

Experience gained during the war by the many new industrial plants, erected with private and Federal money, indicates that while the general recommendation has been a nominal 50 footcandles, the actual equipment installed has resulted in an average level of illumination of approximately 30 footcandles. While this difference between recommendations and practice may seem excessive, it should cause no alarm because the future potential market at even the 30 footcandles level is enormous.

2. Light Sources

The extent to which fluorescent lighting has been used during the war may serve as an indication that lighting of this type is definitely here to stay. Certainly it is safe to say that the improvements possible in fluorescent lighting can be expected to be greater than with incandescent. We believe that while incandescent lighting may never be completely superseded by newer types, the bulk of the future industrial lighting market will be in:

(a) Fluorescent, both high and low voltages.
(b) Combinations of mercury and incandescent.
(c) High wattage mercury (3000 watt—AH-9).
(d) Supplementary fluorescent and incandescent units of good design.

3. Equipment

Wartime restrictions placed on the lighting industry can be expected to be lifted as soon as possible. Talks with plant maintenance people lead us to the conclusion that they prefer:

(a) Steel reflectors
(b) Equipment of sturdy construction
(c) Equipment easy to relamp and service
(d) Equipment easy to clean

Fixture manufacturers will do well to consider these suggestions.

4. Evaluation of Market

As previously pointed out, three billion square feet of industrial areas will be inadequately lighted after the war. In order to bring these areas up to wartime standards, the lighting load must be increased in these areas from an average of one watt per square foot to an average of two watts per square foot. If three billion square feet are lighted for two thousand hours per year, this means an increase of six billion kilowatthours per year. This kilowatthour increase at a unit cost of one cent means an annual increase of sixty million dollars in gross revenues for the electric utility industry.

744 Out of 745 Say— "Electric Service Is Good"

THE Georgia Public Service Commission looks after the interests of the people in the matter of public utility service, as well as in the matter of rates. The Commission not only sees to it that the prices charged are reasonable, but it makes continuous investigations to be sure that the patrons of the various companies are satisfied with the kind of service they get.

During the first quarter of 1945, engineers of the Commission conducted 745 interviews with leading citizens in approximately 200 Georgia towns. The inquiries were made in the smaller and medium-sized towns, because the Commission, and everybody else, pretty well takes it for granted that people in the large cities get good service as a matter of course.

Not more than five people were interviewed in any town.

Of the 745 people interviewed, 744 said their electric service was Good. One man, a citizen of Darien, said it was Fair. Darien is away down on the coast of Southeast Georgia, near Brunswick. This particular individual had no special fault to find, and he was the only one of five people in Darien who did not say the service was good.

All of the other 744 said their electric service was Good.

The Georgia Power Company provides electric service in 565 cities, towns and villages throughout an area comprising three-quarters of the state of Georgia. A few are large cities, such as Atlanta, Augusta, Macon and Columbus. The great majority are small communities of less than 1000 population.

All of them get their electric service at the same low rates. And all of them get equally good service.

The small towns and rural areas suffer by comparison with the large cities in many public services. Generally speaking, they don't have as good schools, hospitals, fire protection, railway and bus service, postal service, waterworks and sanitary facilities, libraries and others.

They do have as good electric service. They say so themselves. The Public Service Commission's independent survey is proof.—*From Two Bells, published weekly by Georgia Power Co.*

A Public Utility Credit Policy

By Gordon Ross
Rochester Gas & Electric Corporation

A paper prepared for Joint AGA-EEI Customer Activities Report

THE sale of public utilities' services is essentially credit business. Accounts are opened, service made available and later, after meter readings are taken to determine the extent of use, bills are issued and payment is anticipated. In this respect utilities are not unlike other retail credit businesses which may decline to accept an account, whereas utilities may seek to protect themselves against loss by obtaining a security deposit from an applicant whose credit standing is unsatisfactory.

Other retail businesses obtain applications, make credit investigations and establish procedures, as part of a definite credit policy, to govern credit authorization, the opening of accounts, and collections. The procedures are similar in most retail businesses and they are quite generally known to the credit seeking public. It seems logical, therefore, for public utilities also to have credit policies embracing applications, deposits, and collection procedures, which, because they are not unlike those of other retailers, would be known and understood by our customers and those who seek our services. This need is even more essential when, in addition to selling gas and electricity, we engage in the sale of appliances, coke, repair services, or a dealer cooperative sales plan involving credit responsibilities of the purchasers.

The demands for our services are so universal that some utilities seem to have felt there is no need to change their policies. Even now we find those who decline service until the residential applicant has made a personal call at their offices to sign a formal application and pay the "customary" deposit. On the other hand, we have those utilities who take no deposits whatever from residential customers, and they neither require nor accept a customer's signature. Data accumulated in this study seem to support the "middle of the road" policy of securing reasonable information about a new customer, accepting his signature if he calls at the office, and requiring a deposit only when he is known to have an unsatisfactory record. Such a policy makes it possible to establish a record that will enable the utility to know the customer and consequently to apply intelligence and good judgment in subsequent transactions involving credit purchases or delinquent accounts.

First impressions are lasting, and this should be borne in mind in connection with the greeting of new customers. If there is a receptionist, or if others first contact the newcomer, it goes without saying that he should be graciously approached and properly directed to the service representative who will care for his needs. The confidential nature of this interview requires that it be handled in privacy, rather than at a congested counter where others may overhear. Indicative of the trend in this direction is the fact that 61 percent of the 18 companies recently surveyed accept applications at desks only; 28 per cent accept them at both desks and counters, and only 11 per cent at counters only.

The next consideration is the questions to be asked. Some may feel it to be adequate to ask only the applicant's name, what he wants, and where he wants it. This would scarcely be sufficient to establish a record of the customer that would be of any assistance at a later time. On the other hand, a customer may become annoyed by being required to answer unnecessary questions. Certain fundamental information will be given by the average applicant without offense because it is what he would customarily give to any store from whom he was seeking credit. Obviously we must know his name, where and when service is desired, and other essential information to make it possible to provide the service desired. This information is routine and the name, of course, should be in full, that is, given name, middle initial and last name. Justification for this lies in the fact that we have so many customers with similar names that we must avoid confusing the accounts.

Other questions are asked to a varying degree by most utilities for purposes of further identification of the applicant, to facilitate credit approval, and, if need be, to assist in the collection of the account. For instance, 77 per cent of those surveyed ask the applicant's former address, 77 per cent ask if he had utility service account there, 44 per cent ask the name of the utility which served him, 66 per cent ask his place of employment, and 60 per cent his occupation.

Less frequently asked are the wife's name (33 per cent), how long at former address (33 per cent), badge number of employee (22 per cent), and trade references (22 per cent).

If a customer returns to a locality it is the practice of 72 per cent of the companies to ask the same questions as on the first contact, except that two companies do not repeat if the customer returns within a year. Two companies do not ask any of the above questions unless the customer desires to attempt to establish credit "in lieu of placing the customary deposit."

The matter of obtaining the applicant's signature does not seem any longer to be considered an absolute rule. Only 66 per cent report that the signature is required or accepted, while 33 per cent presumably do not get it at all. There are those who contend that the signature adds weight to the original transaction, and as it inflicts no hardship on the applicant, it should be accepted. The psychological effect of so doing is good, whereas too lax a requirement in this respect is apt to create the impression that it would not be difficult to obtain service under false pretenses.

Applications are accepted by telephone by 88 per cent of the companies surveyed. 12 per cent do not accept applications by telephone, but ask their prospective customers to come to the office to apply. Of those who do accept applications by telephone it is of interest to note that an average of 53 per cent of all residential applications are received in this manner, with one company receiving 73 per cent by telephone. When telephoned applications are received by those who normally require signatures they are usually obtained by the turn-on man or by mail.

More than half of the companies responding endeavor to obtain applications in the name of the head of the family, although many will accept the wife's name if requested. All but one company accept requests for transfer of service to a new address by telephone.

Experience in the retail credit granting field has proved that better than 98 per cent of the people are honest and it

is not necessarily found that the percentage of dishonest people is greater in any particular locality. Yet it is surprising to learn that 28 per cent of the companies reporting require deposits from most residential customers, with one company requiring deposits from all except property owners with good credit standing. 33 per cent require deposits from most applicants for service moving into certain areas or districts presumably where collection experience has been bad. All but one company (which does not accept any residential deposits) require deposits when they *know* an applicant's credit is unsatisfactory, and 44 per cent require deposits when they are uncertain about an applicant's credit. On the other hand, 66 per cent give service without deposit to *most* residential customers, and 50 per cent do not ask deposits unless they know applicant has a poor credit record.

As a means of determining the credit standing of an applicant 39 per cent of the companies send inquiries to the utility which previously supplied the applicant, but two of them only do this if the previous supplier was a branch or affiliate of their own company.

Seventy-seven per cent of those reporting refund deposits after a satisfactory record of payment has been established, usually one year. Of those who do not have such a plan, one company retains deposits until service is terminated. In 83 per cent of the companies deposits are accepted by the person who accepts the application, while the others apparently refer the customer to some other person or department for this purpose.

The requirement of a deposit often subjects a new applicant to hardship or at least inconvenience at a time when he is usually confronted with the expense of establishing himself in a new residence. Such a condition may cause him to have an unfavorable, if not definitely hostile, attitude toward the particular utility involved, and perhaps utilities in general. Furthermore, a comparison of the actual net loss due to bad debts of a company having a liberal credit policy with those of a company requiring deposits from most customers may show surprisingly little difference, if any. If this is true, the rigid "deposit demanding" company is not only building ill will for itself and the industry, but is paying unnecessary interest charges and maintaining unnecessary deposit records and reports.

The so-called standard credit application used by most retail stores has, in addition to the customer's name and address, some 33 questions of a highly personal nature concerning the applicant. In the utility field it seems that the *maximum* is about nine questions other than those having to do with the service characteristics and the plans for making it available. It would seem to be a fair conclusion, therefore, that rather than causing offense by being too inquisitive about our new customers, we have a tendency to be not sufficiently interested in them to obtain the information that will enable us to classify them from a credit standpoint. Consequently, without such classification, all delinquents are subjected to a routine collection procedure which in itself is a source of irritation and a deterrent to good customer relations. Furthermore, if we engage in appliance or coke sales business and do not maintain suitable records to classify those who seek to purchase on credit terms, delays in credit authorization create a lack of desire to deal with us.

While some localities have a large transient or floating population, this is not the usual thing. A high percentage of our customers remain permanently in the same community. Therefore, the establishment of a proper record in those cases, supplemented by actual experience with them in matters of credit purchases or collection activities, is not a difficult job and it does enable the utility to serve its customers more effectively.

Policies and procedures governing credit extensions and collection activities have a far reaching effect on customer relations. It is therefore of prime importance that we recognize and avoid those things that create antagonism. Those who seek utility service will answer reasonable questions and sign an application without offense if the contact is diplomatically and cordially handled. As these things will help to serve him better, it seems wise to obtain them. On the other hand, we may be assured of resentment on the part of the applicant whom we greet coldly and from whom a deposit is demanded because "it is the policy." Equally offensive will the customer find a collection procedure which requires that a final notice be sent whether the bill be $3.00 or $50.00, and the customer a squatter in the shack by the river, or a railroad president on the Avenue.

The exercise of caution is also needed to prevent a shift too far to the other extreme. A loose policy, having as its only objective the desire to create good customer relations, may have the opposite effect because of the loss of respect for the utility by its customers. There are situations where it is wise to request an applicant's signature and where a deposit should be required. Evidence of this lies in the use of fictitious or improper names to an extent far greater than seems to be realized. For instance, two large companies recently found that about 30 per cent of their recoveries of bad debts was from customers who had used fictitious or misleading names when applying for service. Firm and vigorous action is needed to combat this practice. The great diversity of charge-off percentages, unaccounted for by usual factors, gives reason to feel that collection policies in some cases lack sufficient firmness to create respect for the rights of some utilities. Hence, it may be concluded that our success from a customer relations viewpoint, in matters of credit and collection must, to some degree, depend on the customers respect for the soundness of our policies.

Utilities have available the same facilities for obtaining credit information about present and prospective customers as do other retail establishments. In most communities local credit bureaus are well organized and managed. They play a vital part in the credit consciousness of all customers and are worthy of the support and cooperation of utilities. Fear is sometimes expressed that credit bureaus make too many demands for information from utilities. Their successful operation, however, depends on the completeness of their information and many utilities have found it possible to work out a plan with the bureau which would provide all necessary information without the burden of unfair expense or interruptions to routine operation. In some cities utilities provide the credit bureau with the names of all newcomers to their respective cities, whereupon the bureaus immediately obtain credit reports from bureaus at their former locations. Such cooperation helps the bureau, the local merchants, the utility, and frequently the customers as well.

The use of inquiry cards between utilities themselves is another source of information which is helpful. It is found, however, that some utilities are reluctant to answer such inquiries, presumably because they have not maintained records from which the answers are quickly and easily obtainable. If a customer's record has been good it is a matter of courtesy

to him that the inquiring company be told about it. On the other hand, courtesy and cooperation with the inquiring utility should cause it to receive a prompt report in regard to an unsatisfactory credit risk. It is to be regretted that all utilities are not able to cooperate in this respect.

It goes without saying that if utilities are to have credit policies comparable to those of other retail business, they must have credit men with the required training and ability. This means that they must know how and where to secure needed information and be able to apply good judgment to all credit and collection operations. Their value will be enhanced by contact with other credit and bureau men at the meetings sponsored by the credit associations. Here, also, they will be able to dispel the common belief that with utilities it is simply a case of securing *all* accounts by deposit and immediately suspending service to *all* delinquents.

The fundamentals of a credit policy for utilities would therefore seem to be:

a. Greet your prospective customer cordially. Interview him privately.

b. Ask sufficient questions to permit you to know those things you should for your mutual interest.

c. Accept his signature on his first application if you wish. Don't demand it because of "policy."

d. Don't ask for a deposit unless you know his credit standing is unsatisfactory.

e. Allow service to be made available at once, even if further credit investigation is to be made.

f. Establish a record that will enable you to know your customer so you can authorize credit sales promptly and refund deposits automatically when experience justifies this action.

g. Use your customer's record as a basis for collection action on delinquent accounts, thereby assuring the type of action each account should receive.

h. Patronize and give wholehearted support to your local credit reporting

(*Continued on page* 270)

WAY BACK IN '14

This picture, taken about 1914, was loaned to the BULLETIN *through the courtesy of* Powergrams, *employee magazine of the Alabama Power Company, and E. C. Wilson, Selma, Ala., district manager of the company. The occasion of the picture was a "big" campaign to wire a number of homes in Huntsville.*

At that time W. M. Stanley, now vice president in charge of sales of the Alabama Company was manager of operations at Huntsville, and Mr. Wilson was merchandise and promotional salesman.

The campaign was a success. According to *Powergrams*, over 100 home owners agreed to the proposition of a meter loop and three drop cords for the sum of $7.50 of which $3.75 would be absorbed by the Company if the customer met certain requirements. As a special inducement to take on this proposition he was offered service for two months without charge.

To help popularize the campaign for electric lighting for homes the float pictured here was built. It now seems strange that only thirty years ago it was necessary to go to people with a proposition such as was offered at that time to persuade them to use electric lights.

Among the signs on the float was a series reading thus "Orders taken this morning," "House wiring today" and "Service connected today." Mr. Wilson tells us that this was not just "bait" but a promise and that the promise was kept. Probably manager Stanley and salesman Wilson were fearful that if they did not deliver promptly the customer might change his mind.

The unwired homes to which salesmen Stanley and Wilson were addressing their appeals were not hovels and shacks but the better homes in Huntsville of which there were many. Only a few hundred customers had electric service in Huntsville at that time.

Salesman Wilson did not have an easy time of it in selling this proposition; he had a real selling job and not a cinch order-taking job on hand. Many of the "best people" at that time were of the opinion that other forms of lighting were superior to electric light. The fear that caused many of them to buy expensive lightning rods for their homes created doubt of the safety of electricity in their homes.

Personnel of E. E. I. Committees for 1945-1946

Appointments to Edison Electric Institute Committees for the Administrative year 1945-1946 have been nearly completed, and are listed on this and the following pages. Personnel of the Dealer Coordination and the Farm Utilization Committees of the Commercial Division will appear in a later issue.

ACCOUNTING DIVISION

ACCOUNTING DIVISION GENERAL COMMITTEE

Chairman, H. H. SCAFF, Ebasco Services Inc., New York, N. Y.
Vice-Chairman, H. P. TAYLOR, Wisconsin Public Service Corp., Milwaukee, Wis.
W. S. ALT, Union Electric Co. of Missouri, St. Louis, Mo.
H. D. ANDERSON, American Gas & Electric Service Corp., New York, N. Y.
G. J. BRETT, Niagara Hudson Power Corp., Syracuse, N. Y.
E. L. CASSADY, Indianapolis Power & Light Co., Indianapolis, Ind.
L. F. CHAMBERS, Public Utility Engineering & Service Co., Chicago, Ill.
A. S. CORSON, The United Gas Improvement Co., Philadelphia, Pa.
R. B. CURRAN, The Connecticut Power Co., New London, Conn.
A. L. DAVIES, West Penn Power Co., Pittsburgh, Pa.
H. L. GRUEHN, Consolidated Gas Electric Light & Power Co. of Baltimore, Baltimore, Md.
H. B. HARDWICK, The Commonwealth & Southern Corp., New York, N. Y.
A. W. HASTINGS, Epsco, Inc., New York, N. Y.
R. P. KAESSHAEFER, American Water Works & Electric Co. Inc., New York, N. Y.
D. S. KENNEDY, Oklahoma Gas & Electric Co., Oklahoma City, Okla.
R. S. KING, Union Electric Co. of Missouri, St. Louis, Mo.
J. H. LOBBAN, The Detroit Edison Co., Detroit, Mich.
A. G. MITCHELL, Philadelphia Electric Co., Philadelphia, Pa.
C. E. PACKMAN, Middle West Service Co., Chicago, Ill.
F. W. PHELPS, Union Electric Co. of Missouri, St. Louis, Mo.
C. E. PICHLER, Southern California Edison Co. Ltd., Los Angeles, Calif.
L. E. REYNOLDS, The Connecticut Light & Power Co., Hartford, Conn.
R. H. SMITH, The Cleveland Electric Illuminating Co., Cleveland, Ohio.
R. B. TULPIN, Central Illinois Public Service Co., Springfield, Ill.
P. R. WILLIAMS, Virginia Electric & Power Co., Richmond, Va.
A. ROYAL WOOD, The United Illuminating Co., New Haven, Conn.
W. C. YOUNG, Public Service Electric & Gas Co., Newark, N. J.

COMMITTEE ON APPLICATION OF ACCOUNTING PRINCIPLES

Chairman, R. P. KAESSHAEFER, American Water Works & Electric Co. Inc., New York, N. Y.
H. L. GRUEHN, Consolidated Gas Electric Light & Power Co. of Baltimore, Baltimore, Md.
C. E. PACKMAN, Middle West Service Co., Chicago, Ill.
H. H. SCAFF, Ebasco Services Inc., New York, N. Y.
A. H. SCHETTLER, Union Electric Co. of Missouri, St. Louis, Mo.
W. H. SWINNEY, West Penn Power Co., Pittsburgh, Pa.

CUSTOMER ACTIVITIES COMMITTEE

Chairman, F. W. PHELPS, Union Electric Co. of Missouri, St. Louis, Mo.
Vice-Chairman, W. E. STURM, West Penn Power Co., Pittsburgh, Pa.
K. E. BOYLE, The Dayton Power & Light Co., Dayton, Ohio.
P. J. BRAHENEY, Northern States Power Co., Minneapolis, Minn.
H. E. CLIFF, Public Service Electric & Gas Co., Newark, N. J.
J. D. ELLIOTT, The Detroit Edison Co., Detroit, Mich.
TRACY FABIAN, The United Illuminating Co., Bridgeport, Conn.
H. R. FLANEGAN, Philadelphia Electric Co., Philadelphia, Pa.
O. E. FLORA, Pennsylvania Power Company, New Castle, Pa.
P. R. FRY, Columbia Engineering Corp., Columbus, Ohio.
J. R. GARDNER, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.
W. W. HALL, Ebasco Services Inc., New York, N. Y.
HARRY JEFFS, Queens Borough Gas & Electric Co., Far Rockaway, N. Y.
W. R. KEAGY, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.
E. N. KELLER, Philadelphia Electric Co., Philadelphia, Pa.
W. A. KELLY, Consolidated Gas Electric Light & Power Co. of Baltimore, Baltimore, Md.
L. A. MAYO, The Connecticut Light & Power Co., Hartford, Conn.
A. G. NEUMANN, Wisconsin Electric Power Co., Milwaukee, Wis.
W. P. PARKHOUSE, JR., New Orleans Public Service Inc., New Orleans, La.
GLEN RAY, Indianapolis Power & Light Co., Indianapolis, Ind.
R. G. SCHNEIDER, Virginia Electric & Power Co., Richmond, Va.
W. R. SEIDEL, Rochester Gas & Electric Corp., Rochester, N. Y.
F. E. SMITH, Boston Edison Co., Boston, Mass.
H. T. TERRY, Pacific Gas & Electric Co., San Francisco, Calif.
R. B. TULPIN, Central Illinois Public Service Co., Springfield, Ill.
W. H. WATERBURY, American Gas & Electric Service Corp., New York, N. Y.
J. A. WILLIAMS, Niagara Hudson Power Corp., Syracuse, N. Y.

DEPRECIATION ACCOUNTING COMMITTEE

Chairman, A. W. HASTINGS, Epsco, Inc., New York, N. Y.
Vice-Chairman, A. G. MITCHELL, Philadelphia Electric Co., Philadelphia, Pa.
A. E. CRAIG, American Gas & Electric Service Corp., New York, N. Y.
A. ECKSTEIN, New Orleans Public Service Inc., New Orleans, La.
S. L. FERGUSON, The Detroit Edison Co., Detroit, Mich.

F. B. FLAHIVE, Columbia Gas & Electric Corp., New York, N. Y.
W. J. FOSTER, JR., New York State Electric & Gas Corp., Ithaca, N. Y.
H. L. GRUEHN, Consolidated Gas Electric Light & Power Co. of Baltimore, Baltimore, Md.
E. W. HODGES, Pacific Gas & Electric Co., San Francisco, Calif.
P. H. JEYNES, Public Service Electric & Gas Co., Newark, N. J.
H. J. LAWALL, The United Gas Improvement Co., Philadelphia, Pa.
A. C. MCMENIMEN, Boston Edison Co., Boston, Mass.
J. E. MOORE, Ebasco Services Inc., New York, N. Y.
H. W. ROSS, Union Electric Co. of Missouri, St. Louis, Mo.
H. H. SCAFF, Ebasco Services Inc., New York, N. Y.
B. S. SPRAGUE, West Penn Power Co., Pittsburgh, Pa.
H. M. TICKLE, The Commonwealth & Southern Corp., Birmingham, Ala.

Guest Members

L. R. NASH, 155 Main Street, Ridgefield, Conn.
W. H. WILLIAMS, Public Service Co. of New Hampshire, Manchester, N. H.

GENERAL ACCOUNTING COMMITTEE

Chairman, W. C. YOUNG, Public Service Electric & Gas Co., Newark, N. J.
Vice-Chairman, H. B. HARDWICK, The Commonwealth & Southern Corp., New York, N. Y.
E. J. ARMBRUSTER, New Orleans Public Service Inc., New Orleans, La.
H. W. BOOZER, Georgia Power Co., Atlanta, Ga.
O. K. BOYD, Consolidated Gas Electric Light & Power Co. of Baltimore, Baltimore, Md.
CRAD BRAZEL, Duquesne Light Co., Pittsburgh, Pa.
F. P. CLARK, Kansas City Power & Light Co., Kansas City, Mo.
J. F. FARLEY, New York State Electric & Gas Corp., Ithaca, N. Y.
ALEX FRAZER, JR., West Penn Power Co., Pittsburgh, Pa.
J. M. HABER, The Dayton Power & Light Co., Dayton, Ohio.
A. M. HARTOGENSIS, Ebasco Services Inc., New York, N. Y.
J. E. JACKSON, The Cleveland Electric Illuminating Co., Cleveland, Ohio.
HARRY JEFFS, Queens Borough Gas & Electric Co., Far Rockaway, N. Y.
L. M. LAPORTE, Wisconsin Electric Power Co., Milwaukee, Wis.
ELMER LOTHER, Malden Electric Co., Malden, Mass.
J. W. MACKIE, Delaware Power & Light Co., Wilmington, Del.
D. G. MARTIN, Pacific Gas & Electric Co., San Francisco, Calif.
A. C. MCMENIMEN, Boston Edison Co., Boston, Mass.
W. F. R. MÜNNICH, Philadelphia Electric Co., Philadelphia, Pa.
LOUIS PROVENCHER, The Detroit Edison Co., Detroit, Mich.
A. W. SMITH, Worcester County Electric Co., Worcester, Mass.
R. B. TULPIN, Central Illinois Public Service Co., Springfield, Ill.
R. D. WHITE, Union Electric Co. of Missouri, St. Louis, Mo.
W. H. ZIMMER, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.

MATERIALS AND SUPPLIES COMMITTEE

Chairman, R. S. KING, Union Electric Co. of Missouri, St. Louis, Mo.
Vice-Chairman, C. H. ZURNIEDEN, Philadelphia Electric Co., Philadelphia, Pa.
T. W. AYTON, Indianapolis Power & Light Co., Indianapolis, Ind.
G. E. BALCH, Duquesne Light Co., Pittsburgh, Pa.
H. L. BREWER, Consumers Power Co., Jackson, Mich.
H. C. BROWN, Central New York Power Corp., Syracuse, N. Y.
E. S. BROCK, Public Service Electric & Gas Co., Newark, N. J.
K. C. CAMPBELL, The Detroit Edison Co., Detroit, Mich.
W. F. DICKINSON, Southern California Edison Co. Ltd., Los Angeles, Calif.
R. N. DOWLING, New Orleans Public Service Inc., New Orleans, La.
E. D. EMIGH, JR., The United Illuminating Co., New Haven, Conn.
J. T. FOSTER, Public Service Electric & Gas Co., Newark, N. J.
J. A. HERLIHY, Boston Edison Co., Boston, Mass.
H. E. HODGSON, Wisconsin Power & Light Co., Madison, Wis.
W. N. HOLLS, Consolidated Gas Electric Light & Power Co. of Baltimore, Baltimore Md.
K. E. KOOSER, West Penn Power Co., Pittsburgh, Pa.
R. L. LEACH, Georgia Power Co., Atlanta, Ga.
W. P. MCARDLE, Ebasco Services Inc., New York, N. Y.
A. A. MEISENHEIMER, Wisconsin Electric Power Co., Milwaukee, Wis.
A. J. PATRICK, The Dayton Power & Light Co., Dayton, Ohio.
R. W. T. PURCHAS, Middle West Service Co., Chicago, Ill.
E. B. ROBINSON, Rochester Gas & Electric Corp., Rochester, N. Y.
F. R. SCHAEFFER, Pennsylvania Power & Light Co., Allentown, Pa.
R. W. SEIPLE, Texas Electric Service Co., Fort Worth, Texas.
R. P. SNOW, The Cleveland Electric Illuminating Co., Cleveland, Ohio.
N. C. STIREWALT, Central Illinois Public Service Co., Springfield, Ill.

Guest Member

E. W. NEUMEYER, Missouri Utilities Co., Cape Girardeau, Mo.

PLANT ACCOUNTING AND RECORDS COMMITTEE

Chairman, A. L. DAVIES, West Penn Power Co., Pittsburgh, Pa.
Vice-Chairman, A. J. MAYOTTE, Consumers Power Co., Jackson, Mich.
C. T. ATKISSON, Ebasco Services Inc., New York, N. Y.
J. M. C. BETTS, The United Illuminating Co., New Haven, Conn.
S. H. CADY, Rochester Gas & Electric Corp., Rochester, N. Y.
F. P. CLARK, Kansas City Power & Light Co., Kansas City, Mo.
J. U. DIEHL, Pennsylvania Water & Power Co., Baltimore, Md.
A. N. DURAND, Public Service Electric & Gas Co., Newark, N. J.
GEORGE EILERS, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.
H. W. ENDRES, American Gas & Electric Service Corp., New York, N. Y.
E. D. KING, The Detroit Edison Co., Detroit, Mich.
J. P. LICCIARDI, New Orleans Public Service Inc., New Orleans, La.
A. A. LIPSCHUTZ, Philadelphia Electric Co., Philadelphia, Pa.
J. W. MACKIE, Delaware Power & Light Co., Wilmington, Del.
L. C. PURSELL, Pennsylvania Power & Light Co., Allentown, Pa.
H. J. RUSTAD, Duquesne Light Co., Pittsburgh, Pa.
R. F. STUMPF, Madison Gas & Electric Co., Madison, Wis.

A. V. SCHWARTZ, Columbia Engineering Corp., Columbus, Ohio.
J. L. SUNDAY, Philadelphia Electric Co., Philadelphia, Pa.
G. T. SWISHER, The Potomac Edison Co., Frederick, Md.
R. D. WHITE, Union Electric Co. of Missouri, St. Louis, Mo.
R. S. WILLIAMS, The United Gas Improvement Co., Philadelphia, Pa.

TAXATION COMMITTEE

Chairman, W. S. ALT, Union Electric Co. of Missouri, St. Louis, Mo.
Vice-Chairman, E. W. WILKINSON, American Water Works & Electric Co., Inc., New York, N. Y.
G. L. ANDRUS, New Orleans Public Service, Inc., New Orleans, La.
F. W. COOPER, Public Service Electric & Gas Co., Newark, N. J.
H. C. DERNBERGER, American Gas & Electric Service Corp., New York, N. Y.
R. N. DODDS, Ebasco Services Inc., New York, N. Y.
O. T. FITZWATER, Indianapolis Power & Light Co., Indianapolis, Ind.
J. M. HARKINS, Duquesne Light Co., Pittsburgh, Pa.
H. D. HEIBY, Columbia Engineering Corp., New York, N. Y.
T. W. HOLLAND, Public Service Co. of Oklahoma, Tulsa, Okla.
H. S. HOWARD, Niagara Hudson Power Corp., Syracuse, N. Y.
T. E. HURNS, The Detroit Edison Co., Detroit, Mich.
O. L. K. MCKIBBEN, West Penn Power Co., Pittsburgh, Pa.
A. C. MCMENIMEN, Boston Edison Co., Boston, Mass.
P. J. W. MILLER, Rochester Gas & Electric Corp., Rochester, N. Y.
S. E. RATCLIFFE, Epsco, Inc., New York, N. Y.
L. F. SCOLLEY, The Cleveland Electric Illuminating Co., Cleveland, Ohio.
J. V. SEALY, Philadelphia Electric Co., Philadelphia, Pa.
L. E. SLADE, Iowa Power & Light Co., Des Moines, Iowa.
K. R. TEELE, Stone & Webster Service Corp., New York, N. Y.
C. J. TRUDEAU, Wisconsin Electric Power Co., Milwaukee, Wis.
E. W. VAN FOSSEN, The Potomac Edison Co., Frederick, Md.
J. R. WEGER, Consolidated Gas Electric Light & Power Co., Baltimore, Md.
C. WIGAND, The Commonwealth & Southern Corp., New York, N. Y.
R. S. WILLIAMS, The United Gas Improvement Co., Philadelphia, Pa.

COMMERCIAL DIVISION

COMMERCIAL DIVISION GENERAL COMMITTEE

Chairman, GEORGE W. OUSLER, Duquesne Light Co., Pittsburgh, Pa.
Vice-Chairman, P. M. ALDEN, Philadelphia Electric Co., Philadelphia, Pa.
Vice-Chairman, C. H. LEATHAM, Monongahela Power Co., Fairmont, W. Va.
Vice-Chairman, HARRY RESTOFSKI, West Penn Power Co., Pittsburgh, Pa.
Vice-Chairman, CHARLES SNYDER, Monongahela Power Co., Fairmont, W. Va.
M. W. ARTHUR, Consumers Power Co., Jackson, Mich.
F. A. COFFIN, Wisconsin Electric Power Co., Milwaukee, Wis.
C. A. COLLIER, Georgia Power Co., Atlanta, Ga.
A. C. CRANDALL, Indianapolis Power & Light Co., Indianapolis, Ind.
D. M. DEBARD, Stone & Webster Service Corp., New York, N. Y.
H. E. DEXTER, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.
R. E. FISHER, Pacific Gas and Electric Co., San Francisco, Cal.
R. A. GIBSON, The Hartford Electric Light Co., Hartford, Conn.
R. F. HARTENSTEIN, Ohio Edison Co., Akron, Ohio.
E. F. KELLY, Central Illinois Public Service Co., Springfield, Ill.
CLAUDE D. LAWRENCE, New England Power Service Co., Boston, Mass.
A. V. S. LINDSLEY, The Connecticut Light & Power Co., Waterbury, Conn.
A. D. MCLAY, The Detroit Edison Co., Detroit, Mich.
C. E. MICHEL, Union Electric Co. of Missouri, St. Louis, Mo.
J. E. NORTH, The Cleveland Electric Illuminating Co., Cleveland, Ohio.
W. E. PARROTT, Ebasco Services Inc., New York, N. Y.
J. F. PORTER, JR., Kansas City Power & Light Co., Kansas City, Mo.
P. H. POWERS, West Penn Power Co., Pittsburgh, Pa.
M. R. RODGER, Middle West Service Co., Chicago, Ill.
H. M. SAWYER, American Gas & Electric Service Corp., New York, N. Y.
M. E. SKINNER, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.
H. P. J. STEINMETZ, Public Service Electric & Gas Co., Newark, N. J.
R. H. TILLMAN, Consolidated Gas Electric Light & Power Co., Baltimore, Md.
EDWIN VENNARD, Middle West Service Co., Chicago, Ill.
R. R. WALBRIDGE, Southern California Edison Co., Ltd., Los Angeles, Cal.
G. E. WHITWELL, Philadelphia Electric Co., Philadelphia, Pa.
H. E. YOUNG, Northern States Power Co., Minneapolis, Minn.

SALES TRAINING COMMITTEE

Chairman, M. R. RODGER, Middle West Service Co., Chicago, Ill.
FORD BATES, Nebraska Power Co., Omaha, Neb.
R. S. BELL, The Commonwealth & Southern Corp., New York, N. Y.
JOHN L. BURGAN, New York State Electric & Gas Corp., Ithaca, N. Y.
R. F. HARTENSTEIN, Ohio Edison Co., Akron, Ohio.
J. D. HOWARD, Wisconsin Power & Light Co., Madison, Wis.
H. P. MEGARGEE, American Gas & Electric Service Corp., New York, N. Y.
J. E. NORTH, The Cleveland Electric Illuminating Co., Cleveland, Ohio.
J. S. SCHUCHERT, Duquesne Light Co., Pittsburgh, Pa.
CHARLES SNYDER, Monongahela Power Co., Fairmont, W. Va.
C. A. STEVENS, Public Service Electric & Gas Co., Newark, N. J.
R. P. WAGNER, New York Power & Light Corp., Albany, N. Y.

WIRING COMMITTEE

Chairman, R. F. HARTENSTEIN, Ohio Edison Co., Akron, Ohio.
F. E. DAVIS, The Commonwealth & Southern Corp., Jackson, Mich.
R. E. MAUSK, The Cleveland Electric Illuminating Co., Cleveland, Ohio.

J. J. POWELL, Mississippi Power & Light Co., Jackson, Miss.
H. C. RICE, Southern California Edison Co., Ltd., Los Angeles, Cal.
B. T. SCHECHER, Kansas City Power & Light Co., Kansas City, Mo.
H. R. STEVENSON, The Detroit Edison Co., Detroit, Mich.
J. M. TURNBULL, Western Massachusetts Electric Co., Springfield, Mass.
R. W. WILSON, Kentucky Utilities Co., Lexington, Ky.

COMMERCIAL SALES SECTION

Chairman, P. M. ALDEN, Philadelphia Electric Co., Philadelphia, Pa.

Heating and Motor Applications Committee

Chairman, P. D. LAWRENCE, Virginia Electric & Power Co., Richmond, Va.
C. R. BANES, Long Island Lighting Co., Mineola, N. Y.
J. R. FREDERICK, Wisconsin Power & Light Co., Madison, Wis.
W. A. KANT, Wisconsin Electric Power Co., Milwaukee, Wis.
F. A. KOLB, The Cleveland Electric Illuminating Co., Cleveland, Ohio.
I. LUNDGAARD, Rochester Gas & Electric Corp., Rochester, N. Y.
C. B. MORIN, Ohio Power Co., Canton, Ohio.
E. M. NOTTESTAD, Northwestern Public Service Co., Huron, S. D.
W. GRANT PERRY, New Jersey Power & Light Co., Dover, N. J.
C. J. SODERGREN, Consolidated Gas Electric Light & Power Co., Baltimore, Md.
ROY THURMAN, Indianapolis Power & Light Co., Indianapolis, Ind.
H. W. TITUS, The Dayton Power & Light Co., Dayton, Ohio.

Lighting Committee

Chairman, B. J. JENSEN, Public Service Electric & Gas Co., Newark, N. J.
R. V. BAUER, Ebasco Services Inc., New York, N. Y.
R. M. BROWN, Indianapolis Power & Light Co., Indianapolis, Ind.
H. B. GOULD, Ohio Edison Co., Akron, Ohio.
M. A. HAVENHILL, Kansas City Power & Light Company, Kansas City, Mo.
S. F. MACLEAN, The United Illuminating Co., New Haven, Conn.
J. E. MUELLER, West Penn Power Co., Pittsburgh, Pa.
W. A. STANNARD, Consumers Power Co., Grand Rapids, Mich.

Market Development Committee

Chairman, L. RAY WEAVER, Philadelphia Electric Co., Philadelphia, Pa.
PAUL BROOKS, Ebasco Services Inc., New York, N. Y.
I. C. DIXON, Atlantic City Electric Co., Atlantic City, N. J.
W. G. GENTRY, Consolidated Gas Electric Light & Power Co., Baltimore, Md.
E. B. HASKELL, The United Illuminating Co., New Haven, Conn.
FRED MASON, Brockton Edison Co., Brockton, Mass.
E. L. ROBINSON, Gulf States Utilities Co., Beaumont, Texas.
VERNON E. SHEPHERD, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.

Sales Personnel Committee

Chairman, J. S. SCHUCHERT, Duquesne Light Co., Pittsburgh, Pa.
G. W. ALLISON, Puget Sound Power & Light Co., Seattle, Wash.
J. M. ARTHUR, JR., Kansas City Power & Light Co., Kansas City, Mo.
E. N. AVEGNO, New Orleans Public Service Inc., New Orleans, La.
B. L. ENGLAND, Atlantic City Electric Co., Atlantic City, N. J.
O. R. DOERR, Pacific Gas and Electric Co., San Francisco, Cal.
EDWIN O. GEORGE, The Detroit Edison Co., Detroit, Mich.
L. M. HOLMES, The Dayton Power & Light Co., Dayton, Ohio.
A. H. PALMATIER, Rockland Light & Power Co., Nyack, N. Y.
FRED STAACKE, Houston Lighting & Power Co., Houston, Texas.
A. H. WEGNER, The Washington Water Power Co., Spokane, Wash.

INDUSTRIAL POWER AND HEATING SECTION

Chairman, CHARLES SNYDER, Monongahela Power Co., Fairmont, W. Va.

Competitive Service Committee

Chairman, E. M. CLAPP, Georgia Power Co., Atlanta, Ga.
THOMAS BURNS, American Gas & Electric Service Corp., New York, N. Y.
MAXWELL COLE, Philadelphia Electric Co., Philadelphia, Pa.
J. H. GUMZ, Pacific Gas and Electric Co., San Francisco, Cal.
C. H. PURDY, Consumers Power Co., Jackson, Mich.
W. T. RICHARDS, Indianapolis Power & Light Co., Indianapolis, Ind.

General Power and Heating Committee

Chairman, ROBERT G. ELY, Public Service Electric & Gas Co., Newark, N. J.
F. V. ARMISTEAD, Union Electric Co. of Missouri, St. Louis, Mo.
E. L. KAVANAUGH, The Detroit Edison Co., Detroit, Mich.
L. H. KNAPP, The Hartford Electric Light Co., Hartford, Conn.
PAUL LYMAN, Carolina Power & Light Co., Raleigh, N. C.
FRANCIS MCQUILLIN, West Penn Power Co., Pittsburgh, Pa.
E. L. ROBINSON, Gulf States Utilities Co., Beaumont, Texas.
C. P. YODER, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.

Industrial Lighting Committee

Chairman, J. R. HARTMAN, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.
E. C. EDWARDS, New York State Electric & Gas Corp., Binghamton, N. Y.
FRANK MUELLER, The Cleveland Electric Illuminating Co., Cleveland, Ohio.

Sales Personnel Committee

Chairman, S. R. KNAPP, The Connecticut Light & Power Co., Waterbury, Conn.
H. D. BALLARD, Ebasco Services Inc., New York, N. Y.

RESIDENTIAL SECTION

Chairman, HARRY RESTOFSKI, West Penn Power Co., Pittsbugh, Pa.

Dealer Coordination Committee

Chairman, E. T. MOORE, Virginia Electric & Power Co., Alexandria, Va.
(Personnel to be announced)

Electric Kitchen Committee

Chairman, E. B. HASKELL, The United Illuminating Co., New Haven, Conn.
H. C. AUBREY, Staten Island Edison Co., Staten Island, N. Y.
H. H. BRENAN, Pennsylvania Power & Light Co., Allentown, Pa.
P. V. BROWN, Union Electric Co. of Missouri, St. Louis, Mo.
R. E. GALE, Idaho Power Co., Boise, Idaho.
H. G. ISLEY, Carolina Power & Light Co., Raleigh, N. C.

H. A. KEYS, Northern States Power Co., Minneapolis, Minn.
W. H. MCINNIS, Ebasco Services Inc., New York, N. Y.
T. O. MCQUISTON, Duquesne Light Co., Pittsburgh, Pa.
B. L. PALM, Central Illinois Public Service Co., Springfield, Ill.
H. C. RICE, Southern California Edison Co., Ltd., Los Angeles, Cal.
J. S. SUTHERLAND, Alabama Power Co., Birmingham, Ala.

Electric Water Heating Committee

Chairman, H. P. MEGARGEE, American Gas & Electric Service Corp., New York, N. Y.
A. W. BARSTOW, New England Power Service Co., Boston, Mass.
R. S. BELL, The Commonwealth & Southern Corp., New York, N. Y.
R. C. BRYCE, Philadelphia Electric Co., Philadelphia, Pa.
JULIUS HALL, Appalachian Electric Power Co., Bluefield, W. Va.
H. G. ISLEY, Carolina Power & Light Co., Raleigh, N. C.
J. F. MCALLISTER, Utah Power & Light Co., Salt Lake City, Utah.
C. M. TURNER, Ebasco Services Inc., New York, N. Y.
L. F. RIEGEL, Gulf States Utilities Co., Beaumont, Texas.

Home Service Committee

Chairman, MISS FERN SNIDER, Georgia Power Co., Atlanta, Ga.
MISS MARTHA BOHLSEN, Nebraska Power Co., Omaha, Neb.
MISS ESTHER LEE BRIDE, Union Electric Co. of Missouri, St. Louis, Mo.
MISS MARY BELL BURNETTE, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.
MISS EDITH HITCHCOCK, Alabama Power Co., Birmingham, Ala.
MISS LUCILLE JOHNSON, Public Service Co. of Oklahoma, Tulsa, Okla.
MISS HELEN KIRTLAND, New Jersey Power & Light Co., Dover, N. J.
MISS VIVIAN MARSHALL, New Orleans Public Service Inc., New Orleans, La.
MRS. ROUTH T. NEILL, Kingsport Utilities Co., Kingsport, Tenn.
MISS PRISCILLA PORTERFIELD, Western Massachusetts Electric Co., Pittsfield, Mass.
MRS. LUCILLE RAMERIZ, The Washington Water Power Co., Spokane, Wash.
MRS. EDITH RAUCH, Puget Sound Power & Light Co., Seattle, Wash.

Indoor Climate Committee

Chairman, E. A. FREUND, Union Electric Co. of Missouri, St. Louis, Mo.
H. F. CARR, Consolidated Gas Electric Light & Power Co., Baltimore, Md.
W. P. DAVIS, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.
W. B. FARNSWORTH, Georgia Power Co., Atlanta, Ga.
C. K. GRAHAM, Southern Indiana Gas & Electric Co., Evansville, Ind.
R. C. MCFADDEN, Southern California Edison Co., Ltd., Los Angeles, Calif.
A. C. MCMICKEN, Portland General Electric Co., Portland, Ore.
J. T. SCHILLING, Iowa Power & Light Co., Des Moines, Ia.

Lighting Committee

Chairman, H. A. STROUD, Monongahela Power Co., Fairmont, W. Va.
A. I. BENEDICT, San Diego Gas & Electric Corp., San Diego, Calif.
C. T. BISHOFF, Pennsylvania Power & Light Co., Allentown, Pa.
MRS. CATHERINE GOODALL, Philadelphia Electric Co., Philadelphia, Pa.
J. R. GUIDROZ, New Orleans Public Service Inc., New Orleans, La.
MISS MARY W. HELD, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.
C. B. HELLMAN, Consolidated Gas, Electric Light & Power Co., Baltimore, Md.
E. A. OLSEN, Idaho Power Co., Boise, Idaho.
T. A. PILKEY, Staten Island Edison Co., Staten Island, N. Y.
J. B. REEDER, Southwestern Gas & Electric Co., Shreveport, La.
HOMER SHAW, Utah Power & Light Co., Salt Lake City, Utah.

Sales Personnel Committee

Chairman, C. A. STEVENS, Public Service Electric & Gas Co., Newark, N. J.
E. M. COBB, Ohio Power Co., Canton, Ohio.
E. J. FITZGERALD, Niagara Hudson Power Corp., Syracuse, N. Y.
C. S. STACKPOLE, Consolidated Gas Electric Light & Power Co., Baltimore, Md.

RURAL SECTION

Chairman, C. H. LEATHAM, Monongahela Power Co., Fairmont, W. Va.

Equipment Distribution Committee

Chairman, R. T. JONES, Pennsylvania Power & Light Co., Allentown, Pa.
A. G. BUR, Wisconsin Public Service Corp., Green Bay, Wis.
J. C. CAHILL, The Detroit Edison Co., Detroit, Mich.
ROY W. GODLEY, Monongahela Power Co., Fairmont, W. Va.
C. E. JEERINGS, Rochester Gas & Electric Corp., Rochester, N. Y.
C. L. OSTERBERGER, Louisiana Power & Light Co., New Orleans, La.
F. L. RIMBACH, New England Power Service Co., Boston, Mass.
H. A. SMITH, Nebraska Power Co., Omaha, Neb.
D. E. STEWART, Carolina Power & Light Co., Raleigh, N. C.
C. P. WAGNER, Northern States Power Co., Minneapolis, Minn.
F. M. WIGSTEN, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.
J. H. VAN AERNAM, New York Power & Light Corp., Albany, N. Y.

Farm Utilization Committee

Chairman, to be announced.
(Personnel to be announced)

Service Extension Committee

Chairman, H. J. GALLAGHER, Consumers Power Co., Jackson, Mich.
ARNOLD HOGAN, Indiana General Service Co., Marion, Ind.
E. A. LEWIS, Ohio Power Co., Canton, Ohio.
J. A. MAHR, Indianapolis Power & Light Co., Indianapolis, Ind.
R. G. WALTER, Wisconsin Power & Light Co., Madison, Wis.

Sales Personnel Committee

Chairman, JOHN L. BURGAN, New York State & Electric Corp., Ithaca, N. Y.
C. J. FUHRMANN, The Dayton Power & Light Co., Dayton, Ohio.
ROY W. GODLEY, Monongahela Power Co., Fairmont, W. Va.
A. E. SCHWARZ, Ebasco Services, Inc., New York, N. Y.

ENGINEERING DIVISION

ENGINEERING DIVISION GENERAL COMMITTEE

Chairman, E. S. FIELDS, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.

Secretary, ALEXANDER MAXWELL, Edison Electric Institute, New York, N. Y.

P. H. CHASE, Philadelphia Electric Co., Philadelphia, Pa.

S. M. DEAN, The Detroit Edison Co., Detroit, Mich.

E. W. DILLARD, New England Power Service Co., Boston, Mass.

J. H. FOOTE, Consumers Power Co., Jackson, Mich.

W. P. HAMMOND, Georgia Power Co., Atlanta, Ga.

H. L. MELVIN, Ebasco Services, Inc., New York, N. Y.

G. G. POST, Wisconsin Electric Power Co., Milwaukee, Wis.

H. J. SCHOLZ, The Commonwealth & Southern Corp., Birmingham, Ala.

PHILIP SPORN, American Gas & Electric Service Corp., New York, N. Y.

I. C. STEELE, Pacific Gas & Electric Co., San Francisco, Calif.

Ex-Officio Members

H. S. FITCH, West Penn Power Co., Pittsburgh, Pa.

L. R. GATY, Philadelphia Electric Co., Philadelphia, Pa.

R. T. HENRY, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.

P. M. LEFEVER, Susquehanna Electric Co., Conowingo, Md.

J. A. MORRIS, American Gas & Electric Service Co., New York, N. Y.

A. E. SILVER, Ebasco Services, Inc., New York, N. Y.

R. M. VAN DUZER, JR., The Detroit Edison Co., Detroit, Mich.

ELECTRICAL EQUIPMENT COMMITTEE

Chairman, H. S. FITCH, West Penn Power Co., Pittsburgh, Pa.

Secretary, H. E. KENT, Edison Electric Institute, New York, N. Y.

HARRIS BARBER, New England Power Service Co., Boston, Mass.

JOHN W. BENNETT, Western Massachusetts Electric Co., Springfield, Mass.

L. BIRCKHEAD, Consolidated Gas Electric Light & Power Co., Baltimore, Md.

A. J. BORCHERS, Central Illinois Public Service Co., Springfield, Ill.

F. S. BROWN, Duquesne Light Co., Pittsburgh, Pa.

CHESTER A. CORNEY, Boston Edison Co., Boston, Mass.

R. P. CRIPPEN, Ebasco International Corp., New York, N. Y.

H. E. DEARDORFF, The Dayton Power & Light Co., Dayton, Ohio.

L. K. DEL'HOMME, Houston Lighting & Power Co., Houston, Texas.

A. G. DEWARS, Northern States Power Co., Minneapolis, Minn.

HENRY A. DRYAR, Philadelphia Electric Co., Philadelphia, Pa.

H. W. EALES, Public Utility Engineering & Service Corp., Chicago, Ill.

E. S. FITZ, Virginia Electric & Power Co., Richmond, Va.

J. H. FOOTE, The Commonwealth & Southern Corp., Jackson, Mich.

LESTER R. GAMBLE, The Washington Water Power Co., Spokane, Wash.

A. C. GOHLKE, The Cleveland Electric Illuminating Co., Cleveland, Ohio

I. W. GROSS, American Gas & Electric Service Co., New York, N. Y.

W. E. GUNDLACH, Wisconsin Electric Power Co., Milwaukee, Wis.

G. H. HAGAR, Pacific Gas & Electric Co., San Francisco, Calif.

S. M. HAMILL, JR., The Cincinnati Gas & Electric Co., Cincinnati, Ohio.

JOE HELLENTHAL, Puget Sound Power & Light Co., Seattle, Wash.

R. T. HENRY, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.

E. A. HESTER, Duquesne Light Co., Pittsburgh, Pa.

C. T. HUGHES, The Connecticut Light & Power Co., Waterbury, Conn.

LLOYD F. HUNT, Southern California Edison Co., Ltd., Los Angeles, Calif.

J. COLEMAN JONES, Florida Power & Light Co., Miami, Fla.

E. J. KARSTEN, The United Light & Power Service Co., Davenport, Iowa.

H. J. KLUMB, Rochester Gas & Electric Corp., Rochester, N. Y.

F. D. KNIGHT, The Hartford Electric Light Co., Hartford, Conn.

F. A. LANE, American Gas & Electric Corp., New York, N. Y.

J. P. LEWIS, The Connecticut Power Co., Stamford, Conn.

S. J. LISBERGER, Pacific Gas & Electric Co., San Francisco, Calif.

W. W. PERRY, New York State Electric & Gas Corp., Binghamton, N. Y.

G. M. POLLARD, Buffalo Niagara Electric Corp., Buffalo, N. Y.

CARL D. PRICE, The Columbus & Southern Ohio Electric Co., Columbus, Ohio.

H. B. ROBINSON, Carolina Power & Light Co., Raleigh, N. C.

H. J. SCHOLZ, The Commonwealth & Southern Corp., Birmingham, Ala.

H. K. SELS, Public Service Electric & Gas Co., Newark, N. J.

E. B. SHEW, Philadelphia Electric Co., Philadelphia, Pa.

A. E. SILVER, Ebasco Services, Inc., New York, N. Y.

L. M. SMITH, Alabama Power Co., Birmingham, Ala.

E. H. SNYDER, Public Service Electric & Gas Co., Newark, N. J.

STANLEY STOKES, Union Electric Co. of Missouri, St. Louis, Mo.

STANLEY C. TOWNSEND, Pennsylvania Power & Light Co., Allentown, Pa.

B. VAN NESS, JR., Safe Harbor Water Power Corp., Baltimore, Md.

RUSSELL G. WARNER, The United Illuminating Co., New Haven, Conn.

W. F. WETMORE, The Detroit Edison Co., Detroit, Mich.

R. W. WILBRAHAM, United Engineers & Constructors, Inc., Philadelphia, Pa.

H. B. WOOD, Stone & Webster Engineering Corp., Boston, Mass.

HYDRAULIC POWER COMMITTEE

Chairman, PAUL M. LEFEVER, Susquehanna Electric Co., Conowingo, Md.

C. R. BLISS, New England Power Service Co., Boston, Mass.

G. H. BRAGG, Pacific Gas & Electric Co., San Francisco, Calif.

E. H. COLLINS, The Washington Water Power Co., Spokane, Wash.

ALBION DAVIS, Union Electric Co. of Missouri, St. Louis, Mo.

WALTER DREYER, Pacific Gas & Electric Co., San Francisco, Calif.

A. T. LARNED, Ebasco Services, Inc., New York, N. Y.

E. S. LOANE, Pennsylvania Water & Power Co., Baltimore, Md.

STANLEY MOYER, Philadelphia Electric Co., Philadelphia, Pa.

E. L. PETERSON, American Gas & Electric Service Corp., New York, N. Y.

G. R. STRANDBERG, Stone & Webster Engineering Corp., Boston, Mass.
E. B. STROWGER, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.
G. R. WOODMAN, Southern California Edison Co., Ltd., Los Angeles, Calif.

METER AND SERVICE COMMITTEE

Chairman, J. A. MORRIS, American Gas & Electric Service Corp., New York, N. Y.
H. A. BROWN, Rochester Gas & Electric Corp., Rochester, N. Y.
A. L. CARVILL, Ebasco Services, Inc., New York, N. Y.
A. B. CRAIG, Boston Edison Co., Boston, Mass.
F. E. DAVIS, The Commonwealth & Southern Corp., Jackson, Mich.
H. A. HOWERY, Kansas City Power & Light Co., Kansas City, Mo.
EDGAR L. HUGHES, Pacific Gas & Electric Co., San Francisco, Calif.
H. M. JOHNSON, New England Power Service Co., Boston, Mass.
E. E. KLINE, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.
WALTER G. KNICKERBOCKER, The Detroit Edison Co., Detroit, Mich.
E. A. LEFEVER, Buffalo, Niagara & Eastern Power Corp., Buffalo, N. Y.
T. G. PITZER, West Penn Power Co., Pittsburgh, Pa.
FRANK A. REDDING, Southern California Edison Co., Ltd., Los Angeles, Calif.
FRED L. RICK, Jersey Central Power & Light Co., Asbury Park, N. J.
G. B. M. ROBERTSON, Philadelphia Electric Co., Philadelphia, Pa.
F. H. ROGERS, Consolidated Gas Electric Light & Power Co., Baltimore, Md.
J. N. SCHWARTZ, The Columbus & Southern Ohio Electric Co., Columbus, Ohio.
B. E. SEGALL, New Orleans Public Service, Inc., New Orleans, La.
H. F. SPREEN, Texas Electric Service Co., Fort Worth, Texas.
RICHARD B. SWALLOW, Public Service Electric & Gas Co., Newark, N. J.
H. L. THOMSON, The Hartford Electric Light Co., Hartford, Conn.
W. L. WADSWORTH, Northern States Power Co., Minneapolis, Minn.
EDWARD W. WALTON, The United Illuminating Co., Bridgeport, Conn.
C. F. WHITEMAN, The Cleveland Electric Illuminating Co., Cleveland, Ohio.

PRIME MOVERS COMMITTEE

Chairman, ROBERT M. VAN DUZER, JR., The Detroit Edison Co., Detroit, Mich.
W. H. ALDRICH, The Cleveland Electric Illuminating Co., Cleveland, Ohio.
J. R. BAKER, Pennsylvania Water & Power Co., Baltimore, Md.
M. F. BEEBE, The United Illuminating Co., New Haven, Conn.
R. N. BENJAMIN, Georgia Power Co., Atlanta, Ga.
S. E. BOWLER, Long Island Lighting Co., Roslyn, N. Y.
A. A. CASEY, The Cleveland Electric Illuminating Co., Cleveland, Ohio.
W. L. CHADWICK, Southern California Edison Co., Ltd., Los Angeles, Calif.
F. S. CLARK, Stone & Webster Engineering Corp., Boston, Mass.
C. W. E. CLARKE, United Engineers & Constructors, Inc., Philadelphia, Pa.
SABIN CROCKER, The Detroit Edison Co., Detroit, Mich.
E. R. CROFTS, Rochester Gas & Electric Corp., Rochester, N. Y.
G. C. DANIELS, The Commonwealth & Southern Corp., Jackson, Mich.
A. S. DAVIS, New England Power Service Co., Boston, Mass.
F. L. DORNBROOK, Wisconsin Electric Power Co., Milwaukee, Wis.
DWIGHT DOUGLASS, The Hartford Electric Light Co., Hartford, Conn.
J. M. DRABELLE, Iowa Electric Light & Power Co., Cedar Rapids, Iowa.
M. V. DRAKE, Monongahela Power Co., Fairmont, W. Va.
W. C. DRUMMOND, Public Utility Engineering & Service Corp., Chicago, Ill.
V. F. ESCOURT, Pacific Gas & Electric Co., San Francisco, Calif.
HERBERT ESTRADA, Philadelphia Electric Co., Philadelphia, Pa.
J. N. EWART, Buffalo Niagara Electric Corp., Buffalo, N. Y.
F. P. FAIRCHILD, Public Service Electric & Gas Co., Newark, N. J.
S. N. FIALA, American Gas & Electric Service Co., New York, N. Y.
W. W. FORMAN, The Connecticut Light & Power Co., Waterbury, Conn.
E. C. GASTON, The Commonwealth & Southern Corp., Birmingham, Ala.
G. S. GETHEN, Philadelphia Electric Co., Philadelphia, Pa.
C. Z. GILLIVAN, The Columbus & Southern Ohio Electric Co., Columbus, Ohio.
W. GREACEN, 3RD, New York State Gas & Electric Corp., Binghampton, N. Y.
L. E. HANKISON, West Penn Power Co., Pittsburgh, Pa.
FRANK HENRY, Rochester Gas & Electric Corp., Rochester, N. Y.
H. G. HIEBELER, Houston Lighting & Power Co., Houston, Texas.
WALTER H. JONES, Duquesne Light Co., Pittsburgh, Pa.
GEORGE W. KEEN, Consolidated Gas Electric Light & Power Co., Baltimore, Md.
J. A. KEETH, Kansas City Power & Light Co., Kansas City, Mo.
A. H. KRAUSS, Ebasco Services, Inc., New York, N. Y.
E. H. KRIEG, American Gas & Electric Service Corp., New York, N. Y.
W. R. LAMOTTE, Public Service Electric & Gas Co., Newark, N. J.
J. W. MACKENZIE, Consumers Power Co., Jackson, Mich.
JOHN MADDEN, Montaup Electric Co., Fall River, Mass.
RALPH H. MCCUMBER, Rochester Gas & Electric Corp., Rochester, N. Y.
H. C. MILLER, Public Service Testing Laboratory, Maplewood, N. J.
E. H. MITSCH, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.
J. F. MUIR, American Water Works & Electric Co., Inc., New York, N. Y.
G. A. ORROK, JR., Boston Edison Co., Boston, Mass.
J. C. PHILLIPS, Ebasco International Corp., New York, N. Y.
A. L. POLLARD, Puget Sound Power & Light Co., Seattle, Wash.
R. C. POWELL, Pacific Gas & Electric Co., San Francisco, Calif.
T. E. PURCELL, Duquesne Light Co., Pittsburgh, Pa.
J. D. ROBERTS, Central Illinois Public Service Co., Springfield, Ill.
A. J. SKAALE, Carolina Power & Light Co., Raleigh, N. C.
D. W. STEWART, New Orleans Public Service, Inc., New Orleans, La.
E. H. THROCKMORTON, The United Light & Power Service Co., Davenport, Iowa.
G. V. WILLIAMSON, Union Electric Co. of Missouri, St. Louis, Mo.
S. F. WHIRL, Duquesne Light Co., Pittsburgh, Pa.
C. C. WILLIS, Oklahoma Gas & Electric Co., Oklahoma City, Okla.
C. C. WHELCHEL, Buffalo Niagara Electric Corp., Buffalo, N. Y.

TRANSMISSION AND DISTRIBUTION COMMITTEE

Chairman, L. R. GATY, Philadelphia Electric Co., Philadelphia, Pa.
Secretary, C. M. MOSHER, Edison Electric Institute, New York, N. Y.
C. H. ANDERSON, Buffalo Niagara Electric Corp., Buffalo, N. Y.
JOHN BANKUS, Portland General Electric Co., Portland, Ore.
C. E. BATHE, Oklahoma Gas & Electric Co., Oklahoma City, Okla.
G. W. BEAN, Texas Electric Service Co., Fort Worth, Texas.
C. J. BELLER, The Cleveland Electric Illuminating Co., Cleveland, Ohio.
A. BODICKY, Union Electric Co. of Missouri, St. Louis, Mo.
THOMAS BROSNAN, Buffalo Niagara Electric Corp., Buffalo, N. Y.
R. A. BROWN, The Columbus & Southern Ohio Electric Co., Columbus, Ohio.
B. H. CLINGERMAN, Northern States Power Co., Minneapolis, Minn.
H. T. CORCORAN, The Connecticut Light & Power Co., Waterbury, Conn.
C. C. CORNELIUS, Kansas City Power & Light Co., Kansas City, Mo.
R. R. COWLES, Pacific Gas & Electric Co., San Francisco, Calif.
M. T. CRAWFORD, Puget Sound Power & Light Co., Seattle, Wash.
G. E. DEAN, Public Service Electric & Gas Co., Newark, N. J.
HAROLD J. DEBAUN, Long Island Lighting Co., Mineola, N. Y.
W. R. DOAR, Carolina Power & Light Co., Raleigh, N. C.
ROY L. DODD, Wisconsin Electric Power Co., Milwaukee, Wis.
H. A. ENOS, American Gas & Electric Service Corp., New York, N. Y.
G. H. FIEDLER, Rochester Gas & Electric Corp., Rochester, N. Y.
F. M. FULLER, Pennsylvania Power & Light Co., Allentown, Pa.
M. W. GHEN, Duquesne Light Co., Pittsburgh, Pa.
J. E. GOODWIN, Indianapolis Power & Light Co., Indianapolis, Ind.
W. E. GUNDLACH, Wisconsin Electric Power Co., Milwaukee, Wis.
R. R. HABBERLEY, Western Massachusetts Electric Co., Springfield, Mass.
T. H. HAINES, Boston Edison Co., Boston, Mass.
EDWIN HANSSON, Pennsylvania Water & Power Co., Baltimore, Md.
T. G. HIERONYMUS, Kansas City Power & Light Co., Kansas City, Mo.
F. A. KENDIG, The Dayton Power & Light Co., Dayton, Ohio.
JOHN A. KOONTZ, Pacific Gas & Electric Co., San Francisco, Calif.
R. O. LOOMIS, Georgia Power Co., Atlanta, Ga.
C. T. MALLOY, Southern California Edison Co., Ltd., Los Angeles, Calif.
J. S. MALOY, West Penn Power Co., Pittsburgh, Pa.
G. B. MCCABE, The Detroit Edison Co., Detroit, Mich.
W. MCLEAN, Consolidated Gas, Electric Light & Power Co., Baltimore, Md.
R. C. MORRIS, Union Electric Co. of Missouri, St. Louis, Mo.
R. E. MORSE, American Gas & Electric Service Corp., New York, N. Y.
L. L. NEWMAN, New Orleans Public Service, Inc., New Orleans, La.
E. F. NUEZEL, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.
E. W. OESTERREICH, Duquesne Light Co., Pittsburgh, Pa.
F. W. PACKER, Pennsylvania Power & Light Co., Allentown, Pa.
W. C. PHILLIPS, New England Power Service Co., Boston, Mass.
M. H. PRATT, Central New York Power Corp., Syracuse, N. Y.
J. A. PULSFORD, Public Service Electric & Gas Co., Newark, N. J.
T. A. PURTON, Utah Power & Light Co., Salt Lake City, Utah.
B. C. RUSSELL, Idaho Power Co., Boise, Idaho.
FRANK E. SANFORD, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.
E. V. SAYLES, Consumers Power Co., Jackson, Mich.
H. P. SEELYE, The Detroit Edison Co., Detroit, Mich.
A. E. SILVER, Ebasco Services, Inc., New York, N. Y.
C. T. SINCLAIR, Duquesne Light Co., Pittsburgh, Pa.
F. W. SMITH, Virginia Electric & Power Co., Richmond, Va.
HOWARD E. STITES, Central Illinois Public Service Co., Springfield, Ill.
WALTER A. UPHAM, The United Illuminating Co., New Haven, Conn.
G. S. VAN ANTWERP, Philadelphia Electric Co., Philadelphia, Pa.
L. P. WORKS, Wisconsin Public Service Corp., Green Bay, Wis.

GENERAL COMMITTEES

ACCIDENT PREVENTION COMMITTEE

Chairman, D. C. STEWART, Niagara Hudson Power Corp., Buffalo, N. Y.
Secretary, C. M. MOSHER, Edison Electric Institute, New York, N. Y.
H. P. ALLEN, Rockland Light & Power Co., Boston, Mass.
E. E. BECK, P. O. Box 1663, Sante Fe, N. M.
H. H. BERMAN, Consolidated Gas Electric Light & Power Co., Baltimore, Md.
C. B. BOULET, Wisconsin Public Service Co., Milwaukee, Wis.
J. T. BRADSHAW, Puget Sound Power & Light Co., Seattle, Wash.
H. J. BURTON, Consumers Power Co., Jackson, Mich.
J. G. DICKINSON, Wisconsin Electric Power Co., Milwaukee, Wis.
GEORGE S. DIEHL, Pennsylvania Water & Power Co., Baltimore, Md.
R. P. DOUGLAS, The Detroit Edison Co., Detroit, Mich.
D. C. DUNCAN, Appalachian Electric Power Co., Bluefield, W. Va.
B. K. DUNSHEE, Pacific Gas and Electric Corp., San Francisco, Calif.
F. W. FISHER, Rochester Gas & Electric Corp., Rochester, N. Y.
ROY M. GODWIN, Philadelphia Electric Co., Philadelphia, Pa.
E. E. GROVER, The Columbus & Southern Ohio Electric Co., Columbus, Ohio.
EARL A. HEWITT, Utah Power & Light Co., Salt Lake City, Utah.
EVERETT L. IDE, The United Illuminating Co., Bridgeport, Conn.
E. J. KREH, Duquesne Light Co., Pittsburgh, Pa.
DON T. LACEY, Central Illinois Public Service Co., Springfield, Ill.
WILLS MACLACHLAN, 620 University Ave., Toronto, Can.
J. P. MCCANN, New England Power Service Co., Boston, Mass.
HOWARD MILLER, Southern California Edison Co., Ltd., Los Angeles, Calif.
J. B. PORCHER, Ohio Edison Co., Akron, Ohio.
C. N. RAKESTRAW, The Cleveland Electric Illuminating Co., Cleveland, Ohio.
ALBERT A. RALL, Kansas City Power & Light Co., Kansas City, Mo.

W. T. ROGERS, Ebasco Services, Inc., New York, N. Y.
E. C. RUE, Boston Edison Co., Boston, Mass.
GEORGE J. RUOFF, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.
W. R. SMITH, Public Service Electric & Gas Co., Newark, N. J.
H. O. SPRINKLE, Monongahela Power Co., Fairmont, W. Va.
J. E. STOTT, Georgia Power Co., Atlanta, Ga.
H. F. WEBB, West Penn Power Co., Pittsburgh, Pa.

COMMITTEE ON INDUSTRIAL RELATIONS

Chairman, H. K. BRECKENRIDGE, West Penn Power Co., Pittsburgh, Pa.
Secretary, C. M. MOSHER, Edison Electric Institute, New York, N. Y.
K. P. APPLEGATE, The Hartford Electric Light Co., Hartford, Conn.
DONALD A. BARTLETT, Western Massachusetts Electric Co., Springfield, Mass.
A. M. BOYD, Philadelphia Electric Co., Philadelphia, Pa.
V. C. BRENNAN, Union Electric Co. of Missouri, St. Louis, Mo.
E. J. BRILL, Pennsylvania Power & Light Co., Hazelton, Pa.
H. M. BRUSMAN, Ebasco Services, Inc., New York, N. Y.
J. W. CAROTHERS, Consolidated Gas, Electric Light & Power Co., Baltimore, Md.
WILLIAM J. COOPER, The United Illuminating Co., New Haven, Conn.
W. N. CUMMINS, JR., Virginia Electric & Power Co., Richmond, Va.
E. W. DOEBLER, Long Island Lighting Co., Mineola, N. Y.
H. L. DONALDSON, Duquesne Light Co., Pittsburgh, Pa.
M. T. DUNLAP, Carolina Power & Light Co., Raleigh, N. C.
SYDNEY L. HALL, The Cleveland Electric Illuminating Co., Cleveland, Ohio.
J. O. HENKEL, JR., Alabama Power Co., Birmingham, Ala.
F. L. LARKIN, Wisconsin Electric Power Co., Milwaukee, Wis.
H. A. PETERSON, American Gas & Electric Service Co., New York, N. Y.
FRED A. RAUCH, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.
H. M. SHARP, Buffalo Niagara Electric Corp., Buffalo, N. Y.
B. K. SWARTZ, The Detroit Edison Co., Detroit, Mich.
W. F. TAIT, Public Service Electric & Gas Co., Newark, N. J.
R. H. THOMPSON, Central Illinois Public Service Co., Mattoon, Ill.
O. VAN RYE, New England Power Service Co., Boston, Mass.

INSURANCE COMMITTEE

Chairman, J. H. NICKELL, Philadelphia Electric Co., Philadelphia, Pa.
I. M. CARPENTER, Ebasco Services, Inc., New York, N. Y.
R. D. CONSTABLE, Niagara Hudson Power Corp., Syracuse, N. Y.
F. H. DECKMAN, Columbia Engineering Corp., Columbus, Ohio.
R. FLEMING, Stone & Webster Service Corp., New York, N. Y.
F. J. HOLUB, Duquesne Light Co., Pittsburgh, Pa.
WILLS MACLACHLAN, 620 University Ave., Toronto, Can.
JOHN L. MACLEOD, The Detroit Edison Co., Detroit, Mich.
A. M. PARKER, Central Illinois Public Service Co., Springfield, Ill.
J. G. REESE, Consolidated Gas Electric Light & Power Co., Baltimore, Md.
A. W. REID, American Gas & Electric Service Corp., New York, N. Y.
A. ROYAL WOOD, The United Illuminating Co., New Haven, Conn.

MEMBERSHIP COMMITTEE

Chairman, J. F. FOGARTY, The North American Co., New York, N. Y.
W. W. FREEMAN, Columbia Gas & Electric Corp., New York, N. Y.
E. S. THOMPSON, American Water Works & Electric Co., Inc., New York, N. Y.
GEORGE N. TIDD, American Gas & Electric Co., New York, N. Y.
JUSTIN R. WHITING, The Commonwealth & Southern Corp., New York, N. Y.

RATE RESEARCH COMMITTEE

Chairman, F. A. NEWTON, The Commonwealth & Southern Corp., New York, N. Y.
Vice-Chairman, E. N. STRAIT, Public Utility Engineering & Service Corp., Chicago, Ill.
H. H. AGEE, Public Service Electric & Gas Co., Newark, N. J.
S. W. ANDREWS, American Gas & Electric Service Corp., New York, N. Y.
B. B. BECKETT, Pacific Gas & Electric Co., San Francisco, Calif.
R. E. CAYWOOD, West Penn Power Co., Pittsburgh, Pa.
IRA L. CRAIG, Philadelphia Electric Co., Philadelphia, Pa.
R. D. CUTLER, The Hartford Electric Light Co., Hartford, Conn.
MALCOLM G. DAVIS, Gilbert Associates, New York, N. Y.
C. G. EICHELBERGER, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.
C. L. FOLLMER, Consolidated Gas, Electric Light & Power Co., Baltimore, Md.
LESTER W. FRANK, Western Massachusetts Electric Co., Springfield, Mass.
N. E. FRENCH, Duquesne Light Co., Pittsburgh, Pa.
K. W. HASBROUCK, New York State Electric & Gas Corp., Binghamton, N. Y.
RUSSELL HASTINGS, Boston Edison Co., Boston, Mass.
E. F. KELLY, Central Illinois Public Service Co., Springfield, Ill.
C. R. LANDRIGAN, The Detroit Edison Co., Detroit, Mich.
L. R. LEFFERSON, Ebasco Services, Inc., New York, N. Y.
A. V. S. LINDSLEY, The Connecticut Light & Power Co., Waterbury, Conn.
C. E. NEIL, The North American Co., New York, N. Y.
L. V. NELSON, Union Electric Co. of Missouri, St. Louis, Mo.
H. H. PLANK, Delaware Power & Light Co., Wilmington, Del.
W. E. ROGERS, Indianapolis Power & Light Co., Indianapolis, Ind.
ARTHUR SCHULTHEIS, Central New York Power Corp., Syracuse, N. Y.
EDWARD VENNARD, Middle West Service Co., Chicago, Ill.
H. C. WEBB, Puget Sound Power & Light Co., Seattle, Wash.
C. A. WILLIAMS, The United Illuminating Co., New Haven, Conn.

STATISTICAL COMMITTEE

Chairman, W. N. LEWIS, Ebasco Services, Inc., New York, N. Y.
DEWEY G. BAKER, Nebraska Power Co., Omaha, Neb.
C. E. BANKWITZ, Western Massachusetts Electric Co., Turners Falls, Mass.
W. G. BOURNE, JR., The Commonwealth & Southern Corp., New York, N. Y.
P. J. FALLON, Middle West Service Co., Chicago, Ill.
M. D. FIELD, The California-Oregon Power Co., Medford, Ore.
ALFRED GRUHL, Wisconsin Electric Power Co., Milwaukee, Wis.

(*Continued on page 270*)

Artificial Respiration

By W. R. Smith

Past Chairman, Accident Prevention Committee. EEI, and Sponsor, Subject of Resuscitation

Authorities on the subject of manual techniques stress importance of immediate and uninterrupted artificial respiration whenever natural breathing is inadequate.

OVER the past several years there have arisen doubts in the minds of some of those in the electric light and power and gas industries concerning the matter of what is the correct procedure when a person whose breathing has been stopped or in any way affected as a result of electric shock, gas poisoning, or drowning, is breathing irregularly or weakly. These doubts have concerned the following questions specifically:

Question 1) If the victim is gasping or breathing weakly and irregularly when discovered, should artificial respiration be withheld until victim stops breathing?

Question 2) If after artificial respiration has been administered for a time to a non-breathing victim, natural breathing begins and the victim gasps and breathes weakly and intermittently, should artificial respiration be continued?

Question 3) Are the chances of recovery of a person whose breathing has been stopped or made irregular by accident lessened by any interference of the artificial respiration with the feeble natural breathing because of the fact that the cycles of artificial respiration might be out-of-step with the feeble natural effort?

On behalf of the Edison Electric Institute and the American Gas Association opinions on these questions were recently asked of eminent authorities in the field of physiology and allied fields of research and the above questions have been answer unqualifiedly as follows:

Answer 1) If victim is not breathing in a manner such that there is good evidence of adequacy of lung ventilation, artificial respiration should be started at once. This means that in practically all cases where a victim is discovered gasping or breathing rapidly and weakly or spasmodically, artificial respiration should be administered without delay.

Answer 2) As artificial respiration is administered, the operator should observe the victim to note any signs of the return of natural breathing. If such return is quite positive, as is sometimes the case, the operator should pause for a moment to see if the victim is going to breathe naturally. If, however, this breathing is irregular, weak, or in any other respect ineffective in the operator's judgment, he should continue with his regular cadence of artificial respiration with no necessity for attempting to adjust his cadence to the rapid, slow, or intermittent breathing of the victim.

It is of interest in the above connection to call attention to the fact that there have been a number of instances over the past several years in which victims of suspended respiration have, on being resuscitated, asked for assistance in breathing because of their inability to satisfy their needs through their own natural breathing. Comments to such effect in the sworn statements of those who administered artificial respiration successfully are highly significant in connection with the subject of the above discussion, and give positive evidence of the fact that the continuance of artificial respiration is in every way indicated if lung ventilation is inadequate.

Answer 3) There appears to be no evidence to support any fear that the victim's chances of recovery are lessened by any interference of the manual method with the returning natural respiration. Such research as has been carried on and which is pertinent to this consideration has indicated that any effective manual method definitely takes over the job of ventilating the lungs and there is no conflict with any continuing natural effort. Obviously, as stated above, in all cases where artificial respiration is required there should be momentary pauses, when there is justification for such pause, to see if the victim is going to breathe naturally, but whenever the natural effort is in any way inadequate artificial respiration should be immediately resumed.

The statements made above confirm the opinions of those in the electric light and power and gas industries who have been close to the development of manual techniques and also of those who have had the opportunity to study the experience in these industries over the years since the standardization of the prone pressure method. These statements have been presented to and discussed with representatives of the American Red Cross and the suggestion made that these points be considered in connection with any forthcoming revision of the American Red Cross First Aid Text book.

Personnel of E.E.I. Committees

(*Continued from page* 269)

C. D. HAMLIN, Buffalo Niagara Electric Corp., Buffalo, N. Y.

ALAN W. HASTINGS, Epsco, Inc., New York, N. Y.

RUDOLPH JENNY, Pacific Gas & Electric Co., San Francisco, Calif.

F. A. KEANE, Public Service Electric & Gas Co., Newark, N. J.

C. R. LANDRIGAN, The Detroit Edison Co., Detroit, Mich.

WINSOR MARTIN, Public Utility Engineering & Service Corp., Chicago, Ill.

M. G. MILLER, West Penn Power Co., Pittsburgh, Pa.

F. H. PATTERSON, Rochester Gas & Electric Corp., Rochester, N. Y.

FRED L. SHIMER, Central Illinois Public Service Co., Springfield, Ill.

O. E. SMITH, Consolidated Gas, Electric Light & Power Co., Baltimore, Md.

WILLIAM STORZ, Philadelphia Electric Co., Philadelphia, Pa.

BERTON STOUT, Indianapolis Power & Light Co., Indianapolis, Ind.

C. L. WALLING, American Gas & Electric Service Corp., New York, N. Y.

A Public Utility Credit Policy

(*Continued from page* 260)

agencies. Use other credit information channels freely.

i. Have your credit man become active in your local credit associations. The benefits should be mutual.

Credit is used in retail business as a service and convenience to customers, and it seems that utilities should look upon it in the same light. Retail credit policies are based on constant research and long experience. Utilities have likewise had long experience and done considerable research, but the results are not shown in uniformly improved credit technique. The results in other retail businesses have shown their policies to be fundamentally sound. Application of similar policies in the utility field should have comparable results.

As we begin a new era of business expansion with the end of the war it appears that more favorable customer reaction will result from policies that are not different from those generally used. *In the last analysis, there seems to be no reason to be different unless we can be better.*

RECENT E.E.I. PUBLICATIONS

Principles of System Relaying

EEI Pub. M-3. A report of the Electrical Equipment Committee, Edison Electric Institute, 44 pages. Price $.60 to members and their employees; $1.50 to non-members in the U. S. A.; $1.65 to foreign countries.

THIS report contains a series of papers and accompanying discussions which constitute a symposium on the principles of system relaying presented in two parts at successive meetings of the Electrical Equipment Committee. One part deals with Metropolitan type systems and the other with transmission type systems. The papers cover several different systems and illustrate the application of relaying principles to a variety of system conditions.

A-C Network Operations 1941-1943

EEI Pub. M-1. A report of the Transmission and Distribution Committee, Edison Electric Institute, 46 pages. Price $.60 to members and their employees; $1.50 to non-members in the U. S. A.; $1.65 to foreign countries.

DATA on the operation of the 287 networks in 167 localities have been submitted by 85 companies for the period 1941-1943, inclusive. These data have been tabulated, summarized and compared with data of previous reports wherever possible.

The peak load served by low voltage a-c networks in 1943 was 2,073,643 kva, an average annual increase of nearly 5.5 per cent since 1940. The total installed transformer capacity was 4,710,292 kva in 1943, an average annual increase of 5.6 per cent since 1940. These increases in the previous report were each 9 per cent per year.

Almost 37 per cent of the companies supply their network systems with a primary voltage in the 13- to 14-kv class. The 120/208, 3-phase, 4-wire is still the most widely used network system voltage.

The motor fly ball type of protector comprises 45 per cent of the total protectors in service. Of the relays used in protectors approximately 70 per cent are of the three-phase master relay-disk type.

The failure rate of protectors on normal switching and testing has approximately doubled since the previous report. This is due to fewer normal testing operations probably caused by manpower shortages. The total number of protector failures to operate under faults is the same, whereas the rate of protector failures per 100 fault operations has doubled since the previous report.

The oil-filled transformers comprises 87 per cent of the total banks and 85 per cent of the total capacity. This report also shows a definite increase in use of the non-inflammable fluid-filled transformers. The failure rate of transformers purchased prior to January 1. 1931, is approximately 2½ times that of transformers purchased after January 1, 1931. Moisture is the cause of the greatest number of transformer failures. Approximately 55 per cent of all transformer failures occurred in the primary winding and 25 per cent in the primary terminals or potheads.

The failure rate of all secondary cable is about two failures per 100 mile-years for the period covered by this report. This ratio is approximately the same as that of the previous report.

Of the three most widely used types of cable, paper-lead, rubber-lead and non-leaded, the failure rates are, respectively, 3.62, 0.63, and 0.56 per 100 cable mile-years. Excluding the failures that occurred in joints, these rates become 1.34, 0.53 and 0.47 for paper-lead, non-leaded and rubber-lead, respectively.

Twenty-four companies report the use of limiters, 14 the use of fuses and 20 reported the use of both. Seven limiters were blown during 11 failures of secondary cables reported as having been protected by 65 limiters. Nine fuses were blown during six failures protected by 26 fuses.

The number of complete network outages has continued to increase whereas the outage rate per locality per year has decreased from 0.43 in the 1940 report to 0.36 in this report. The average duration of outage was 27.5 minutes for the 1941-1943 period.

There were 14 reported explosions or sustained fires in transformers. These have been listed in order of their occurrences and discussed as to size, type and location of transformer; cause, result and damage of explosion or fire. Explosions without resulting fire occurred on four non-inflammable liquid-filled transformers, three on oil-filled and one on which the cooling medium was not stated. Explosion associated with fire occurred on six oil-filled transformers.

Comparisons with data of the previous reports should be made with these qualifications: that the previous report included only partial data for the small companies, that there were changes in the questionnaire, and that there were changes in the companies reporting.

SECOND REPORT (Revised) E.E.I.—NEMA JOINT COMMITTEE ON STANDARDS FOR DISTRIBUTION TRANSFORMERS

EEI Pub. I-9, NEMA Pub. 111—Revised April, 1945. A report of the Joint Committee of the Edison Electric Institute and National Electrical Manufacturers Association on Standards for Distribution Transformers, 16 pages. Price 25¢ to members and their employees; 60¢ to non-members in U. S. A.; 70¢ to foreign countries.

THIS Second Report (revised) establishes design standards for certain mechanical and electrical features of single phase, pole type distribution transformers rated 100 kva and below, 15,000 volts and below, with low-voltage ratings of 600 volts and below.

The First Report of the E.E.I.-NEMA Joint Committee on Standards for Distribution Transformers was published in February, 1940, as E.E.I. Publication No. G6, NEMA Publication No. 106, and embraced single-phase, 60-cycle, pole-type, distribution transformers rated 25 kva and below, 15,000 volts and below. The Second Report extended the range of rating of the First Report to cover single-phase, 60-cycle transformers up to 100 kva, inclusive, 15,000 v and below. It supersedes completely the First Report.

Prompted by experience, the Second Report, as published in January, 1942, has now been revised in several details, and a new edition printed. The January, 1942, edition therefore is no longer authentic, and is superseded by the 1945 edition.

Modifications in the January, 1942, edition as incorporated in the 1945 edition of the Second Report are summarized below:

(a) Low voltage of 120/240 v instead of 120 v—2-wire on 1½-kva transformers without taps.

(b) Low voltage of 240/480 v series-multiple or 3-wire instead of 240 × 480 series-multiple only.

(c) Standardization on transformers with high voltage rated 14,400/13,800/13,200/12,870/12,540 to provide a combination rating in this general voltage class for ratios of 110, 115, and 120:1.

(d) All 25-kva ratings designed for Type A lugs and 24 in. pole bolt spacing; instead of Type A lugs and 12 in.

on 25 kva, 5000 v and below, and Type B lugs and 24 in. spacing on 25 kva, 5,001 v and above.

(e) Modifications in Sizes 1 and 2 T-crossarm hangers to provide:

(1) Longer yoke for greater clearance to crossarm bolt.

(2) One-half inch shallower yoke to fit crossarm better.

(3) Junction of vertical member and yoke welded all around and bolt hole omitted for better joint protection.

(4) Hot-dip galvanized hangers and kickers (subject to war limitations).

(f) Standardization on cover bushings for transformers 37½ kva-100 kva, inclusive, 7,200-15,000 v, inclusive; with sidewall, pocket or cover bushings remaining standard 25 kva and below.

(g) Minor increases in tolerance or dimensions applying to nameplates, grounding pads, high voltage cover bushings, etc., to eliminate manufacturing difficulties.

(h) Editorial changes to factor modifications listed above, to provide up-to-date reference identifications and to provide increased clarity.

John L. O'Toole

JOHN L. O'TOOLE, retired vice president of the Public Service Corp. of New Jersey, died at his home in Newark on September 9 at the age of 73.

As vice president in charge of public relations from 1923 to 1942, Mr. O'Toole had served as a spokesman for the corporation and its subsidiary companies.

Mr. O'Toole joined the corporation in 1909, when Thomas N. McCarter, now chairman of the board, made him a publicity agent. He later organized the company's present public relations and advertising department. He was elected a director in 1938 and resigned on May 15 of this year because of illness.

His business career began in 1892 with The Newark *Times*. A year later he joined his brother, the late Peter J. O'Toole, on the staff of the Newark *News*. After eight years as a reporter, he was appointed city editor, serving until he joined the Public Service Corporation.

For many years Mr. O'Toole was active in The Newark Chamber of Commerce, serving as its representative at the Chamber of Commerce of the United States.

Large Scale Charts Available for NESC Calculations

THE National Bureau of Standards has announced that certain large scale charts and nomographs, reproducing those that appear in the Discussion of the National Electrical Safety Code, Part 2, (Handbook H-39) are now available for sale through the government Printing Office.

The charts and nomographs comprising the set are:

Conductor Loading Nomograph, 2 charts
Catenary Curve
Ultimate Resisting Moments of Wood Poles
Bending Moment due to Wind Pressure on Pole

These are figures 16, 18, 20 and 19 at pages 114 and 115, 151, 155 and 153 respectively, in Handbook H-39.

These five charts are reproduced on three 14 x 18 inch sheets. The set may be obtained as "NBS Miscellaneous Publication M-176" from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at 25 cents per set.

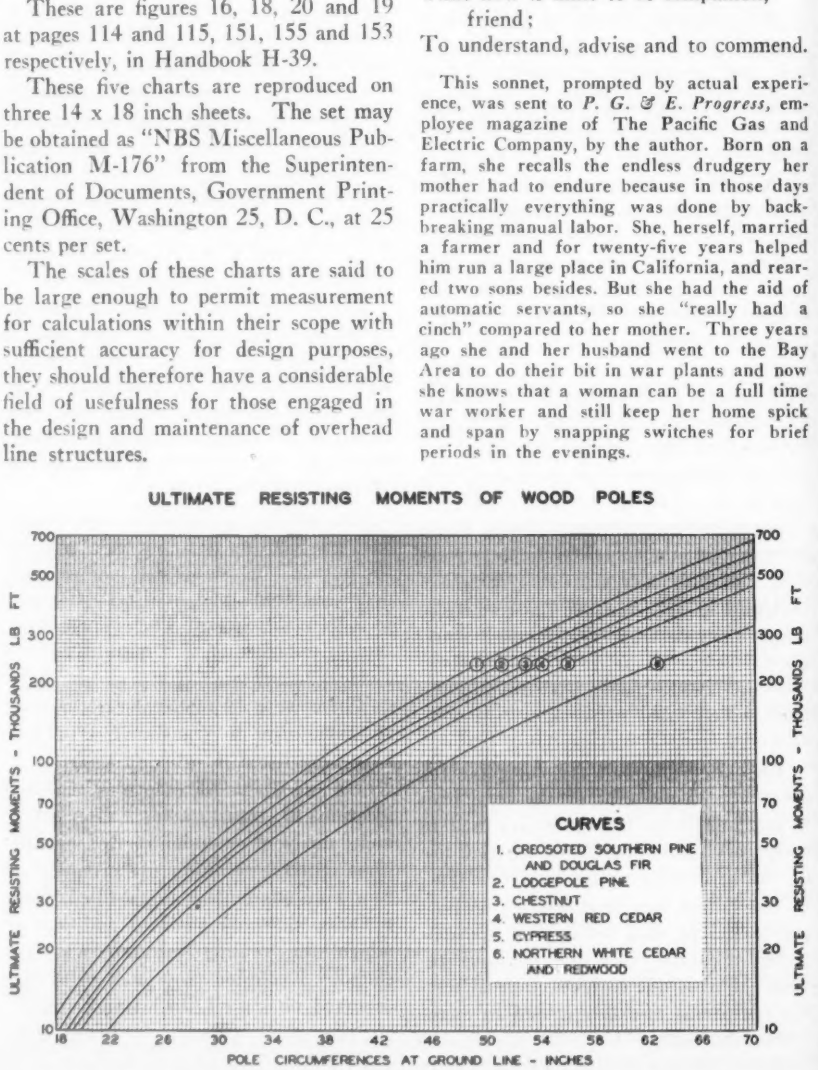
The scales of these charts are said to be large enough to permit measurement for calculations within their scope with sufficient accuracy for design purposes, they should therefore have a considerable field of usefulness for those engaged in the design and maintenance of overhead line structures.

SONNET TO ELECTRICITY

By Mrs. Lester A. Ward

When I consider how my mother spent
Her waking hours in health-destroying tasks,
Careful to show the smiling face that masks
Rebellion in the heart, but still intent
To serve her family and to them present
A smoothly running household, though her cares
Were stealing youth and beauty unawares,
But, knowing nothing better, was content.
Then am I thankful that I live today
When cheap electric power does for me
In half the time, with half the energy,
The jobs that stole my mother's youth away.
Time now is mine to be companion, friend;
To understand, advise and to commend.

This sonnet, prompted by actual experience, was sent to *P. G. & E. Progress*, employee magazine of The Pacific Gas and Electric Company, by the author. Born on a farm, she recalls the endless drudgery her mother had to endure because in those days practically everything was done by back-breaking manual labor. She, herself, married a farmer and for twenty-five years helped him run a large place in California, and reared two sons besides. But she had the aid of automatic servants, so she "really had a cinch" compared to her mother. Three years ago she and her husband went to the Bay Area to do their bit in war plants and now she knows that a woman can be a full time war worker and still keep her home spick and span by snapping switches for brief periods in the evenings.



Specimen Chart for NESC Calculations—greatly reduced

PERSONALS

N. M. ARGABRITE, vice president of the American Gas & Electric Co. and a number of its operating subsidiaries for many years, has resigned all his positions and directorships in the American Gas & Electric Co. system (except his directorship in the Atlantic City Electric Co.), and has been elected president of the Atlantic City Electric Co. Mr. Argabrite succeeds GEORGE N. TIDD, who remains president of American Gas & Electric Co. and all of its principal subsidiaries except the Atlantic City Company. R. E. SWIFT continues as vice president and general manager of the Atlantic City properties.

Mr. Argabrite started on his utility career in 1899 as superintendent of the Ashland (Ky.) Electric Light & Power Co. Subsequently he was made superintendent and the general manager of the Winona (Minn.) Railway & Light Co. and later general manager of the Belvidere (Ill.) Gas & Electric Co.

Since 1910 Mr. Argabrite has been connected with the American Gas & Electric Co., in New York, serving in various executive capacities with that organization and its subsidiaries. Among the companies of which he has been an officer or director are: Appalachian Electric Power Co., Kentucky & West Virginia Power Co., Kingsport Utilities, Inc., Kanawha Valley Power Co., Wheeling Electric Co. and the Scranton Electric Co.

K. M. IRWIN has been appointed manager of the Engineering Department of the Philadelphia Electric Company and subsidiary companies.

He is a native of Waukesha, Wis., and was graduated from the Yale-Sheffield Scientific School as a mechanical engineer. Following short terms of specialized work with the B. F. Sturdevant Company, Hyde Park, Mass.; Stone and Webster, and Perry Barker, both of Boston; and the United States Navy, in Philadelphia, he joined the United Gas Improvement Company organization in 1919 as assistant to the electrical engineer of the Operating and Engineering Department. He was subsequently named mechanical engineer of the Engineering Development Department and continued in that work until transferred to the Philadelphia Electric Company in 1931 as assistant to the vice-president in charge of engineering, the position he held at the time of his recent appointment.

Mr. Irwin is well known in electrical engineering circles and has served on many national committees of various utility associations. Last year he was appointed through the Office of War Utilities, of the War Production Board, to the position of executive director of the London Staff, Public Utility Committee, of the Combined Production and Resources Board, and in this capacity made important contributions to the restoration of utility service in Northwest Europe.

O. T. FITZWATER, formerly assistant treasurer, has been elected treasurer of Indianapolis Power & Light Company, to succeed WILLIAM C. RICHARDSON, who died recently after serving as treasurer since the Company's incorporation. Mr. Fitzwater started his electric company career in his school days, carrying water for a line crew. After leaving high school he became timekeeper at a power plant, and in 1925 was transferred to the general accounting department as a clerk. Completing courses in accounting of Indiana University Extension and the International Accounting Society, he became an accountant in 1936, and assistant treasurer and assistant secretary in 1940.

E. L. CASSADY was elected assistant treasurer to succeed Mr. Fitzwater, and also will serve as administrative assistant to the new treasurer. Mr. Cassady started with the company in 1929 as a clerk, became an accountant in 1933, and in 1940 was placed in charge of original cost work from which he later developed a new property records department. Since March, 1944, he has been administrative assistant.

Changes in the management of three departments of the National Electrical Manufacturers Association and other senior staff changes were made recently.

LESLIE D. PRICE, until August 1, meter and wiring engineer in the electrical distribution department of the Public Service Electric & Gas Co., Newark, N. J., has been appointed manager of the engineering and regulatory legislation departments, taking up his new work on Aug. 1. CHARLES M. COGAN, who has been manager of the engineering department and secretary of the codes and standards committee since 1930, has resigned from those duties in order to give the necessary attention to his personal affairs.

Mr. Price recently was awarded the Thomas N. McCarter Electrical Award for 1944, an annual award made to an employee of Public Service Electric & Gas Co. in either the operating or commercial group of the electrical department of the company who contributed most during the year toward the efficiency and progress of the department. In addition to committee work for the Edison Electric Institute, Mr. Price has been active in the Association of Edison Illuminating Companies. He is a member of the International Association of Electrical Inspectors and has been an alternate member of the light and power group of the electrical committee of the National Fire Protection Association.

LEONARD LATHROP has been added to the staff as manager of the Public Information Center. Mr. Lathrop has had wide experience in publicity, advertising and public relations work, following his graduation from the University of California, and for the past ten years as advertising manager of the Jersey Central Power & Light Co. J. M. Moorhead continues as chief, Public Information Service.

L. BYRON CHERRY, vice president of the Jersey Central Power & Light Co., Asbury Park, N. J., who has been engaged on special accounting, financial and regulatory problems of the company, has resigned, effective Sept. 1. A lawyer, as well as an authority on corporate and regulatory matters, Mr. Cherry will return to private practice, becoming associated with the New York law firm of Hines, Rearick, Dorr & Hammond. He became identified with Jersey Central in 1943, and during his association with this utility he has also done extensive work of a similar nature for utilities in Minnesota, Nebraska, Kansas, Wisconsin, Washington and other states.

RICHARD B. SWALLOW has been appointed meter and wiring engineer, electric distribution department, Public Service Electric & Gas Co., Newark, N. J.

Mr. Swallow will fill the vacancy created by the resignation of LESLIE D. PRICE, who recently joined the staff of the National Electrical Manufacturers Association. A graduate of Worcester Polytechnic Institute. Mr. Swallow, after a period of two years spent on the General Electric test course, started with Public Service in 1925, after being first employed in the office of the meter and wiring engineer, electric distribution department. Following assignments in Essex and Hudson Divisions, of the electric distribution department, Mr. Swallow was appointed division meter engineer, Passaic Division, in 1938 from which position he has just been promoted.

ROBERT E. GINNA, as vice president of the Rochester Gas & Electric Corp., will take over the general supervision of the domestic sales, industrial sales and home service departments of the company. Early this year, Mr. Ginna was elected vice president in charge of rate and regulatory matters, which activities he will continue to direct along with sales. He has long been associated with utility rate and economic research studies.

EDWARD S. NORTHUP recently was added to the staff of the National Adequate Wiring Bureau to undertake field service and to assist in the development of educational and informational materials to further the residential adequate wiring movement. Mr. Northup was connected with the Nebraska Power Co., Omaha, for a number of years.

F. C. BEATTIE, superintendent of the Toronto steam generating plant of the Ohio Edison Co., was the guest of honor at a testimonial farewell dinner held recently in Steubenville. Mr. Beattie retired after completing 21 years of service with the company. He has been succeeded by H. C. MOLTER, formerly assistant plant superintendent.

CLYDE A. MULLEN has been appointed general superintendent of operations of the Jersey Central Power & Light Co., Asbury Park, N. J.

In the 33 years Mr. Mullen has been identified with the electrical industry he has had a varied and well-rounded operating experience. Beginning with the Ohio Electric Railway, Mr. Mullen, later as assistant engineer of tests, became affiliated with the Penn Central Power & Light Co. He returned to Ohio in 1914 to become electric engineer of the Ohio Service Co. and nine years later he was appointed superintendent of substations, subsequently transferring to Pennsylvania Power & Light Co. as assistant superintendent of construction, whence he moved in 1927 to Asbury Park where for four years he was superintendent of operations of the former Eastern New Jersey Power Co. Upon purchase of that company by Jersey Central Power & Light Co. in 1931, Mr. Mullen was named superintendent of the Morristown division, the position he held until his recent promotion. Mr. Mullen succeeds Harold P. Richmond, resigned.

RALPH G. HOEY has been made comptroller of Jersey Central Power & Light Co.

MARTIN LINDSAY, of Chicago, a director of the Middle West Corp., has been elected to the newly created position of chairman of the board. The presidency of the company, made vacant by the resignation of Purcell L. Smith, was left unfilled temporarily. Mr. Smith will continue as a director of Middle West.

For the past 15 years Mr. Lindsay has been vice president and director of the Associated Telephone & Telegraph Co. and the affiliated Automatic Electric Co., both of Chicago. For a number of years prior to his association with these companies he was vice president of the Northern Trust Co., Chicago.

FRANK L. ROHRBACK, underground superintendent of the Washington Water Power Co., Spokane, Wash., has retired after completing 38 years of continuous service. Mr. Rohrback became identified with the Spokane utility in 1907, three years after his graduation from Pennsylvania State College in electrical engineering. During his association with the company, he has supervised the laying and installation of many miles of underground cable in Spokane.

C. A. MOLSBERRY, formerly general superintendent of production of the United Illuminating Co., New Haven and Bridgeport, Conn., has been appointed system planning engineer. He is a graduate of Iowa State College and was associated with General Electric for many years until he joined the Connecticut utility in 1936. M. F. BEEBE succeeds Mr. Molsberry in his former position, and will have general supervision of generating stations, transmission lines and transmission terminal substations.

Mr. Beebe attended the University of Connecticut and was formerly superintendent of distribution in the New Haven division of the U. I. company. W. J. OAKLEY has been appointed superintendent of distribution in the New Haven division, following about 20 years' service with the company. Floyd W. Buck, formerly assistant to the president has been appointed industrial engineer. He will specialize in the field of industrial electronics and conduct engineering studies of a general nature as assigned from time to time by the chief engineer. Mr. Buck is a graduate of the Massachusetts Institute of Technology and was connected with the Charles H. Tenney organization in Boston and Rockland Light & Power Co., Nyack, N. Y., before joining the U. I. company in 1940.

LEWIS A. MCARTHUR, vice president Pacific Power & Light Co., has been awarded the honorary degree of doctor of laws by the University of Oregon. The award was made "in recognition of his painstaking and fruitful researches into the origin of place names in Oregon; the lasting stimulus he gave to widespread popular interest in local history; and his continuing zeal for the social welfare manifested in manifold acts of public service."

A. S. Goss, former superintendent of retail operations of the Georgia Power Company, has been appointed manager of a newly organized industrial relations department of the company. According to W. E. Mitchell, president and general manager, the new department will devote its entire attention to matters of vital interest to every member of the company.

An important part of the work of the industrial relations department will be to assist all division and department heads in developing uniform practices in the hiring, training and upgrading of employes and in developing correct methods of job valuation in an effort to eliminate inequalities and to promote sound labor relations and the general welfare of employes, Mr. Mitchell said.

The safety department, under J. E.

(*Continued on page 276*)

E.E.I. PUBLICATIONS AND SERVICE MATERIAL

(Prices include transportation in U. S. only. Please order by number shown before title. Standing Orders may be placed for a specified number of copies of reports of various committees as issued, to be shipped to one address.)

Payable in United States Currency—Postage Stamps Not Acceptable

Accounting and Statistical

Accounting	Members	Non-Members
Digest of Authoritative Opinions of the Definition of Original Cost (Including Appendix on "Prudent Investment") 1938	$1.50	$1.50
Proceedings—National Accounting Conferences		
Complete Set—8th Conference 1944	2.00	2.00
" " 7th " 1943	2.00	2.00
" " 5th " 1941	2.00	2.00
" " 4th " 1940	2.00	2.00
" " 3rd " 1939	2.00	2.00
" " 2nd " 1938	1.50	1.50
by Groups Yearly—		
Classification of Accounts	.50	50
Customer's Relation	.50	50
Depreciation	.50	50
Plant Accounting and Records	.50	.50
Purchasing Stores & Transportation	.50	.50
General Sessions	.50	.50
Summary of Definitions Covering Depreciation and Related Terms 1939.	1.00	1.00
Statistical		
M-2—Electric Light and Power Industry, 1944 (1945)	.30	.75 .85
L-2—Electric Light and Power Industry in 1943 (1944)	.30	.75
K-2—Electric Light and Power Industry in 1942 (6/43)	.75	.75
J-2—Electric Light and Power Industry in 1941 (5/42)	.30	.75
I-2—Electric Light and Power Industry in 1940 (5/41)	.30	.75
(Statistical Bulletins also available for years 1932 to 1939 inclusive) each	.30	.75
Weekly, Monthly and Annual Statistics (Includes Annual Statistical Bulletin; Weekly Electric Power output; Monthly Electrical Research Statistics).	2.00	2.00

Engineering Committees

ACCIDENT PREVENTION—RESUSCITATION

L-4—Linemen Cutouts (2/45)	.10	
K-8—Pole Top Resuscitation (9/43)	.10	
(Quantity Prices on Application)		
J-9—1941 Accident Statistics of Electric Light & Power Industry (12/42)	.10	.25
F-10—Tree Trimming Practices (10/38)	.20	50
E-12—Resuscitation Booklets (7/37) 1— 9 copies	.10 each	
10— 99 "	.08 "	
100—499 "	.06 "	
C-14—Resuscitation Charts (4/36)	.10	10
C-12—Twelve Messages on Accident Prevention in the Electric Public Utilities (12/35)	.10	.10

ELECTRICAL EQUIPMENT COMMITTEE

M-3 Principles of System Relaying (1945)	.60 1.50	1.65
J-8—Utilization Voltage Standardization Recommendations 1942	.20	.50
F-13—Reconditioning Flood Damaged Electrical Equipment (12/38)	.30	.75
F-5—Design of Switchhouses for Generating Stations and Transmission Substations (6/38)	.40	1.00
E-1—Rectifier Wave Shape (4/37)	.40	1.00
C-10—Symbols for Metering Diagrams (12/35)	.10	10

HYDRAULIC POWER COMMITTEE

D-15—Penstocks (12/35)	1.00	2.50
A-19—Hydraulic Governors (8/33)	.20	.50

JOINT REPORTS

M-5—Principles and Practices for Inductive Coordination, Allocation of Costs and Joint Use of Poles—EEI-Bell Telephone (1945)	No charge	
I-9—Standards for Distribution Transformers (Second Report—Revised) EEI-NEMA (1945)	.25 .60	.70
L-5—Interim Report of The American Research Committee on Grounding (1/44)	.10	
K-1—Volume 5 of Engineering Reports Nos. 39 to 49 of Joint Subcommittee on Development and Research (1/43)	5.00	10.00

Accounting	Members	Non-Members
J-8—Utilization Voltage Standardization Recommendations (10/42)	.20	.50
J-6—Wave Shape of Multi-Phase Rectifiers—Engr. Report No. 49—Joint Subcommittee on Development and Research (8/42)	.50	1.25
J-4—Low Frequency Shielding in Telephone Cables—Engineering Report No. 48—Joint Subcommittee on Development and Research (5/42).	.80	2.00
J-1—Positive Disconnection of Distribution Circuits During Faults to Ground—Engineering Report No. 47—Joint Subcommittee on Development and Research (4/42)	.60	1.50
I-9—Standards for Distribution Transformers (Second Report) EEI-NEMA (12/41)	$0.25	$0.60
I-8—Susceptiveness of Subscriber Station Sets—Engineering Report No. 46—Joint Subcommittee on Development and Research (12/41)	60	1.50
I-7—Frequency Weighting for Message Circuit Noise—Engineering Report No. 45—Joint Subcommittee on Development and Research (12/41)	.20	.50
H-12—Neutralizing Transformers—Engineering Report No. 44—Joint Subcommittee on Development and Research (7/41)	.30	.75
H-10—Effects of Bonding Exchange Aerial Telephone Cable Sheaths to Multi-Grounded Power Neutrals—Engineering Report No. 43—Joint Subcommittee on Development and Research (6/41)	.30	.75
H-8—Standard Basic Impulse Insulation Levels — AIEE-EEI-NEMA (1/41)	.05	.05
H-3—Inductive Coordination Aspects of Petersen Coil Grounding—Engr. Report No. 42—Joint Subcommittee on Development and Research (12/40)	.25	.65
H-1—Test Specifications for Household Electric Ranges—EEI-NEMA (5/40)	.20	.50
G-9—Methods of Measuring Radio Noise—EEI-NEMA-RMA (2/40)	.20	.50
F-17—Short-Circuiting Relay Protectors—Engr. Report No. 41—Joint Subcommittee on Development and Research (8/38)	.40	1.00
F-8—Test Specifications Automatic Electric Storage Water Heaters—EEI-NEMA (10/38)	.20	.50
F-2—Inductive Coordination of Rural Power and Telephone Systems—Engr. Report No. 40—Joint Subcommittee on Development and Research (1/38)	.80	2.00
E-9—Characteristics of Power System No. 39—Joint Subcommittee on Development and Research (11/37)	.60	1.50
E-5—Principles and Practices for Inductive Coordination, EEI-AAR (1/37)	no charge	no charge
E-4—Joint Use of Poles 6.6 and 13.2 kv. Safety Features—EEI-Bell Tel. (1/37)	.30	.75
D-14—Vol. IV—Engineering Reports of the Joint Subcommittee on Development and Research (1/37)	5.00	10.00
D-13—Vol. III—Engineering Reports of the Joint Subcommittee on Development and Research (1/37)	5.00	10.00

PRIME MOVERS COMMITTEE

K-7—Turbines, Condensers, Feedwater Heaters 1942 (9/43)	.25 .65	.75
K-3—Furnace Tube Corrosion (3/43)	.20 .50	60
K-5—Turbine Operation Data (6/43)	.30 .75	.85
J-7—Boilers and Combustion 1941 (10/42)	1.20	3.00
I-6—Metallurgy and Piping, 1940 (12/41)	.70	1.75
I-4—Boiler Auxiliaries, 1940-1941 (10/41)	.90	2.00
H-11—Power Station Chemistry, 1940 (7/41)	.40	1.00
H-9—Turbines, Condensers and Associated Equipment (4/41)	.80	2.00
H-7—Boilers — Combustion, 1940 (3/42)	1.60	4.00
G-10—Boilers, Superheaters, Economizers, Air Heaters & Piping, 1939 (4/40)	.80	2.00
G-7—Turbines, Condensers and Pumps (1/40)	.70	1.75
G-3—Combustion, 1939 (12/39)	.80	2.00
F-15—Boilers, Superheaters, Economizers, Air Heaters and Piping, 1938 (12/38)	1.00	2.50
F-14—Turbines, Condensers and Pumps, 1938 (12/38)	.70	1.75
F-12—Combustion, 1938 (11/38)	1.00	2.50
E-16—Boilers, Superheaters, Economizers, Air Heaters and Piping, 1937 (12/37)	.90	2.35
E-15—Oil and Gas Engines, 1936-1937 (10/37)	.40	1.00
E-14—Turbines, Condensers and Pumps, 1937 (9/37)	.60	1.50
E-11—Combustion, 1937 (9/37)	.80	2.00
E-10—Power Station Chemistry, 1937 (9/37)	.30	.75
D-11—Turbines, Condensers, Feedwater Heaters and Pumps, 1936 (11/36)	$0.60	$1.50
D-10—Oil and Gas Engines, 1935-1936 (10/36)	.40	1.00
D-8—Superposition of High Pressure Non-Condensing Equipment on Existing Power Stations (10/36)	.25	.65
D-7—Combustion, 1936 (10/36)	.60	1.50
D-6—Boilers, Economizers, Air Heaters and Piping, 1936 (9/36)	.60	1.50
D-5—Power Station Chemistry, 1936 (7/36)	.20	.50
C-8—Oil and Gas Engines, 1934-1935 (10/35)	.50	1.25
C-6—Combustion, 1935 (8/35)	.80	2.00
C-5—Turbines, Condensers and Feedwater heaters, 1935 (7/35)	.40	1.00
C-4—Boilers, Economizers, Air Heaters and Piping, 1935 (7/35)	.60	1.50
B-8—Steam Generation (8/34)	.60	1.50
B-7—Oil and Gas Engines (8/34)	.40	1.00
B-5—Station Piping, 1934 (7/34)	.60	1.50
B-4—Turbines, 1934 (6/34)	.40	1.00
B-3—Condensers, Feedwater Heaters, Evaporators, and Boiler Feed Pumps (6/34)	.45	1.15
A-7—Stoker Equipment and Furnaces (8/33)	.60	1.50
A-6—Pulverized Fuel (8/33)	.75	1.85
A-5—Power Station Chemistry (7/33)	.40	1.00
A-4—Burning of Liquid and Gaseous Fuels (7/33)	.30	.75
A-3—Turbines (8/33)	.75	1.85
A-2—Station Piping (8/33)	.60	1.50

TRANSMISSION AND DISTRIBUTION COMMITTEE

M-1—A-C Network Operations 1941-1943 (1943)	.60 1.50	1.65
L-1—Cable Operation—1942 (12/44)	.50	1.25
K-10—Line Clearing Manual 1944 1-9 copies		35c.
K-6—Cable Operation—1941 General (9/43)	.50 1.25	1.35
K-4—A-C Network Operations, 1938-1940 (4/43)	.60 1.50	1.60
J-5—Ice and Wind Loading Tables for Overhead Line Conductors (Revision of Tables 85 to 96 of the Overhead Systems Reference Book) 1942	1-4 copies	10c.
J-3—Cable Operation, 1940 (8/42)	.50	1.25
H-6—Distribution Transformer Load Supervision (3/41)	.60	1.50
H-5—Cable Operations, 1939 (1/41)	.60	1.50
G-5—Cable Operation, 1938 (1/40)	.60	1.50
G-1—A.C. Network Operation, 1936-1937 (8/39)	.80	2.00
F-16—Cable Operation, 1937 (12/38)	.60	1.50
F-10—Tree Trimming Practices (10/38)	.20	.50
F-9—Conductor Sags and Tension for Rural Lines (10/38)	.40	1.00
F-7—Economical Distribution Transformers Loading and Thermal Performance of Distribution Transformers (8/38)	.40	1.00
F-6—Lightning Proof Transmission Lines (7/38)	.60	1.50
F-3—Distribution Transformer Load Characteristics (4/38)	1.00	2.50
F-1—Treatment and Inspection of Creosoted Pine Poles (2/38)	.30	.75
E-17—Cable Operation, 1936 (12/37)	.60	1.50
E-8—A.C. Network Operation, 1934-1935 (6/37)	.70	1.60
D-17—Cable Operation, 1935 (12/36)	.60	1.50
D-9—Principles and Practices in Grounding (10/36)	.40	1.00

SUGGESTIONS FOR SPECIFICATIONS

10 to 49 copies 25% discount
50 or more copies 50% discount

MS-1—Suggestions for Specifications for Standard Dial Constants for Alternating Current Watthour Meters (8/40)	.10	10
MS-2—Suggestions for Specifications for Coordinated and Standardized Low Voltage Metering Current Transformers (8/40)	.10	.10
MS-3—Specifications for Standard Current Transformers for Primary Circuits (8/42)	.10	.10

Accounting	Members	Non-Members
MS-4—Specifications for Indicating and Cumulative Demand Register Scales (8/42)	.10	.10
TD-1—Suggestions for Specifications for Bolts and Nuts (5/37)	.20	.20
TD-2—Suggestions for Specifications for Strand Eye Anchor Rods (5/42)	.10	.10
TD-3—Suggestions for Specifications for Lag Screws (10/38)	.10	.10
TD-4—Suggestions for Specifications for Eye Bolts (6/39)	.10	.10
TD-5—Suggestions for Specifications for Eyenuts and Eyelets (4/41)	.10	.10
TD-6—Suggestions for Specifications for Steel Crossarm Braces (5/40)	$0.10	$0.10
TD-8—Suggestions for Specifications for Straight Tinned Copper Connectors (10/40)	.10	.10
TD-9—Specifications for Single Tube Seamless Copper Splicing Sleeves (10/42)	.10	.10
TD-10—Suggestions for Specification for Rolled Steel Washers (5/40)	.10	.10
TD-51—Suggestions for Specifications for Low and Medium Voltage Fin-Type Lime-Glass Insulators (2/43)	.25	.25
TD-61—Suggestions for Specifications for Type "A" Untreated Douglas Fir Crossarms (11/40)	.10	.10
TD-62—Suggestions for Specifications for Type "B" Untreated Douglas Fir Crossarms (11/40)	.10	.10
TD-71—Suggestions for Specifications for Insulator and Pin Threads and Gauges (5/37)	.10	.10

General Commercial Committees

Lighting		
Typical Promotional Programs—Home Lighting Equipment (1941)	.35	.35
Postwar Planning		
Section I—Basic Planning Material for Electric Utility Companies		$0.50
Section II—An Appraisal of Our Competition		.50
Section III—Rural Electrification		.50
Section IV—Industrial Power Markets		.50
Section V—Market Problems in Residential Field		.50
Section VI—Postwar Lighting Markets		.50
Power		
G-4—Electric Metal-Melting Furnaces (1/40)	.80	2.00
F-11—Electrification of Oil Refineries (10/38)	.30	.75
C-13—Steam and Electrical Requirements of Hotels (12/35)	.30	(members only)
C-2—Steam and Electrical Requirements of Office Building (4/35)	.30	.75
Power Sales Manual (1941)	3.50	5.00
Water Heating		
1-5 Standardization of Electric Water Heating Equipment (10/41)	.20	.50

National Educational Programs

Commercial Cooking		
Commercial Cooking Survey, 1942	$0.25	$0.25
Sales Training Manual—Commercial Electric Cooking, 1941	1-4 copies	$1.50
	5-14 "	1.25
	15 or more	1.00
Domestic Cooking		
Meals Go Modern Electrically (Special prices in quantity)	.25	.25
Electric Kitchens		
It Can Happen In Your Kitchen	$2.80 per 100	
How to Plan a Modern All-Electric Kitchen	$2.00 per 100	
The Principles of Kitchen Planning	.25	.25
Films		
"Dealer Education"—Series of 10 films and 10 discussion manuals. Five on basic selling and five on product selling, i.e., refrigerators, ranges, roasters, water heaters and laundry equipment. Price on meter basis for entire series	$125 to $275	

PERSONALS

(*Continued from page 274*)

Stott, general supervisor of safety and training, will hereafter report to Mr. Goss, as will the insurance department, under the managership of D. C. Jones, in an effort to coordinate the functions of these departments with other matters directly affecting employes.

Following the transfer of C. B. McMANUS, former assistant operation manager, to assistant to the president, and Mr. Goss to the managership of the new industrial relations department, J. M. Oliver, vice president in charge of operations, announces changes in the operating department as follows:

J. F. PENNINGTON will be general superintendent of transmission and distribution, in charge of the work formerly supervised by him as superintendent of wholesale operations, in addition to the work formerly supervised by Mr. Goss as superintendent of retail operations.

T. J. ALLEN will be superintendent of transmission, reporting to Mr. Pennington. Reporting to Mr. Allen will be E. H. WILDBERGER, supervisor of substations; A. C. HENDERSON, supervisor of transmission lines; W. P. SPIER, acting supervisor of communications; and B. F. COLMER, supervisor of building maintenance.

M. L. CATHEY will be superintendent of distribution, including gas operations, and will report to Mr. Pennington. Reporting to Mr. Cathey will be W. D. O'BRIEN, general superintendent of appliance repairs, J. R. RANEY, general meter superintendent, and the distribution engineers of that department.

A. B. GREENE will be superintendent of special construction, in charge of special line and substation construction, and the general repair shop. Mr. Greene will report to Mr. Pennington. Reporting to Mr. Greene will be W. E. BRADLEY, supervisor of line and substation construction, and W. B. PAYNE, supervisor of the repair shop.

R. O. LOOMIS will be special engineer, reporting to the vice president in charge of operation.

The duties of B. W. Sinclair, superintendent of production; R. J. Cooper, protection engineer; R. O. Conwell, system operator; and H. W. Dobbs, acting manager of the land department, will remain unchanged.

A catalog of EEI publications is available upon request to EDISON ELECTRICAL INSTITUTE 420 Lexington Avenue, New York

	Members	Non-Members
Lighting Booklets		
Better Light—Better Sight—Better Production	$1.50 per 100	
Better Light—Better Sight—Better Living	$3.00 per 100	
Better Light—Better Sight—Better Sales	$1.50 per 100	
Priceless Eyes	4.50 per 100	
Lighting Films		
"Time to Relight"—(Commercial) sound slide 15 minutes, 85 pictures	$10.00 film & disc	
"Light Up — Step Up" — (Industrial) sound slide 15 minutes, 75 pictures	$10.00 " " "	
"You Can Do Something About It" —(Home) sound slide, 15 minutes, 95 pictures	$10.00 " " "	
Wiring		
Rewiring for Commercial and Industrial Buildings	$0.25	$0.25
Handbook of Interior Wiring Design—1937	.50	.50
Basic Factors of Adequate Wiring —1939	.25	.25
Covered Neutral Cable Helps Sell Adequate Home Wiring—1939	.25	.25
Commercial Building Re-wiring Market—1939	.35	.35
	(Price on above three books as a group is 60c per set)	
Films		
Commercial Re-Wiring — lantern slides	Set $17.50	
Home Wiring—lantern slides	Set 25.00	

Miscellaneous, Reference Books, etc.

	Members	Non-Members
Code for Electricity Meters (1941)	$1.60	$2.00
Good Radio Reception (1937)	100 copies	4.00
	1000 "	25.00
	3000 "	60.00
	5000 "	95.00
Objective Type Rates, 1933-1936	.80	2.00
Ice and Wind Loading Tables for Overhead Line Conductors (Revision of Tables 85 to 96 of the Overhead System Reference Book) 1942	1-4 copies	10c
	5-49 "	6c
Power Sales Manual, plus Sec. 12-13-14 of 1944 (1941)	4.75	7.00
Rate Book for 1943	10.00	25.00
Rewiring for Commercial and Industrial Buildings (1941)	.25	.25
Sales Training Manual—Commercial Electric Cooking (1941)	1.50	1.50
Storm Loading and Strength of Wood Pole Lines and a Study of Wind Gusts (1936)	2.00	5.00
Weekly, Monthly and Annual Statistics (Includes Annual Statistical Bulletin; Weekly Electric Power Output; Monthly Electrical Research Statistics)	2.00	2.00

Periodicals

Better Light—Better Sight News (9 issues yearly)	$0.75	$0.75
Edison Electric Institute Bulletin (Monthly)	2.00	2.50
Rural Electrification Bulletin (5 issues yearly)		1.00

EDISON ELECTRIC INSTITUTE OFFICERS AND COMMITTEES

(Continued)

ADVISORY COMMITTEE

P. S. ARKWRIGHT.....Georgia Power Company, Atlanta, Ga.
D. C. BARNES.....Engineers Public Service Company, New York, N. Y.
H. J. BAUER.....Southern California Edison Co., Ltd., Los Angeles, Calif.
S. R. BERTRON.....Houston Lighting and Power Company, Houston, Tex.
J. B. BLACK.....Pacific Gas and Electric Co., San Francisco, Calif.
JOHN W. CARPENTER.....Texas Power & Light Company, Dallas, Tex.
C. M. COHN.....Consolidated Gas Electric Light & Power Co., Baltimore, Md.
T. D. CROCKER.....Northern States Power Co., Minneapolis, Minn.
J. E. DAVIDSON.....Nebraska Power Company, Omaha, Neb.
SAMUEL FERGUSON .....The Hartford Electric Light Company, Hartford, Conn.
J. F. FOGARTY.....The North American Company, New York, N. Y.
C. E. GROESBECK.....Electric Bond and Share Company, New York, N. Y.
H. P. LIVERSIDGE.....Philadelphia Electric Company, Philadelphia, Pa.
B. W. LYNCH.....San Diego Gas and Electric Company, San Diego, Calif.
P. H. McCANCE.....Duquesne Light Company, Pittsburgh, Pa.
WILLIAM McCLELLAN .....Union Electric Company of Missouri, St. Louis, Mo.
IRWIN L. MOORE.....New England Power Association, Boston, Mass.
A. B. PATERSON.....New Orleans Public Service Inc., New Orleans, La.
H. HOBART PORTER.....American Water Works and Electric Co., Inc., New York, N. Y.
PAUL A. SCHOELLKOPF.....Buffalo Niagara and Eastern Power Corp., Buffalo, N. Y.
GEORGE N. TIDD.....American Gas and Electric Company, New York, N. Y.
S. B. WAY.....Wisconsin Electric Power Company, Milwaukee, Wis.
J. R. WHITING.....The Commonwealth & Southern Corp., New York, N. Y.
E. A. YATES.....The Commonwealth & Southern Corp., New York, N. Y.

CHAIRMEN OF COMMITTEES (1945-1946)

Accident Prevention, D. C. STEWART.....Niagara Hudson Power Corp., Buffalo, N. Y.
Accounting Division General, H. H. SCAFF.....Ebasco Services, Inc., New York, N. Y.
Customer Activities, F. W. PHELPS.....Union Electric Co. of Missouri, St. Louis, Mo.
Depreciation Accounting, A. W. HASTINGS.....Engineers Public Service, Inc., New York, N. Y.
General Accounting, W. C. YOUNG.....Public Service Electric & Gas Co., Newark, N. J.
Plant Accounting and Records, A. L. DAVIES.....West Penn Power Co., Pittsburgh, Pa.
Materials and Supplies, R. S. KING.....Union Electric Co. of Missouri, St. Louis, Mo.
Taxation, W. S. ALT.....Union Electric Co. of Missouri, St. Louis, Mo.
Application of Accounting Principles, R. P. KAESSHAEFER....American Water Works and Electric Co., New York, N. Y.
Commercial Division General, GEORGE W. OUSLER.....Duquesne Light Co., Pittsburgh, Pa.
Engineering Division General, E. S. FIELDS.....The Cincinnati Gas & Electric Co., Cincinnati, Ohio
Electrical Equipment, H. S. FITCH.....West Penn Power Co., Pittsburgh, Pa.
Hydraulic Power, PAUL M. LEFEVER.....Susquehanna Electric Co., Conowingo, Md.
Meter and Service, J. A. MORRIS.....American Gas & Electric Service Co., New York, N. Y.
Prime Movers, R. M. VAN DUZER, JR.....The Detroit Edison Co., Detroit, Mich.
Transmission and Distribution, L. R. GATY.....Philadelphia Electric Co., Philadelphia, Pa.
Industrial Relations, H. K. BRECKENRIDGE.....West Penn Power Co., Pittsburgh, Pa.
Insurance, J. H. NICKELL.....Philadelphia Electric Co., Philadelphia, Pa.
Membership, J. F. FOGARTY.....The North American Co., New York, N. Y.
Prize Awards, P. S. YOUNG.....Public Service Electric & Gas Co., Newark, N. J.
Rate Research, F. A. NEWTON.....The Commonwealth & Southern Corp., New York, N. Y.
Statistical, W. N. LEWIS.....Ebasco Services, Inc., New York, N. Y.
Codes and Standards (a Subcommittee of the Board of Directors), H. B. BRYANS
Philadelphia Electric Co., Philadelphia, Pa.

EDISON ELECTRIC INSTITUTE OFFICERS AND COMMITTEES

OFFICERS

C. W. KELLOGG, *President*.....420 Lexington Avenue, New York 17, N. Y.
J. W. PARKER, *Vice-President*.....The Detroit Edison Company, Detroit, Mich.
H. B. BRYANS, *Vice-President*.....Philadelphia Electric Company, Philadelphia, Pa.
H. S. BENNION, *Vice-President and Managing Director*....420 Lexington Avenue, N. Y. 17, N. Y.
GILBERT W. CHAPMAN, *Treasurer*.....American Water Works and Electric Co. Inc., N. Y.
MAE B. WOODS, *Secretary*.....420 Lexington Avenue, New York 17, N. Y.

BOARD OF DIRECTORS

(Terms Expiring 1945)

H. B. BRYANS.....Philadelphia Electric Company, Philadelphia, Pa.
R. E. DILLON.....Boston Edison Company, Boston, Mass.
J. G. HOLTZCLAW.....Virginia Electric & Power Company, Richmond, Va.
R. H. KNOWLTON.....The Connecticut Light & Power Company, Hartford, Conn.
FRANK MCLAUGHLIN.....Puget Sound Power & Light Co., Seattle, Wash.
W. E. MITCHELL.....Georgia Power Company, Atlanta, Ga.
W. C. MULLENDORE.....Southern California Edison Company, Ltd., Los Angeles, Calif.
W. H. SAMMIS.....Ohio Edison Company, Akron, Ohio
PHILIP SPORN.....American Gas and Electric Service Company, New York, N. Y.
L. V. SUTTON.....Carolina Power & Light Company, Raleigh, N. C.
E. S. THOMPSON.....American Water Works and Electric Company, Inc., New York, N. Y.
G. W. VAN DERZEE.....Wisconsin Electric Power Company, Milwaukee, Wis.
P. S. YOUNG.....Public Service Electric and Gas Company, Newark, N. J.

(Terms Expiring 1946)

H. C. BLACKWELL.....The Cincinnati Gas & Electric Company, Cincinnati, Ohio
W. H. BURKE.....Ebasco Services Incorporated, New York, N. Y.
WILLIAM KELLY.....Buffalo Niagara and Eastern Power Corp., Buffalo, N. Y.
FRANK KRUESI.....Middle West Service Company, Chicago, Ill.
R. E. MOODY.....Union Electric Company of Missouri, St. Louis, Mo.
J. W. PARKER.....The Detroit Edison Company, Detroit, Mich.
H. T. PRITCHARD.....Indianapolis Power and Light Company, Indianapolis, Ind.
K. M. ROBINSON.....The Washington Water Power Company, Spokane, Wash.
E. C. STONE.....Duquesne Light Company, Pittsburgh, Pa.
R. L. THOMAS.....Consolidated Gas Electric Light and Power Co., Baltimore, Md.
WILLIAM WEBSTER.....Massachusetts Utilities Associates, Boston, Mass.
A. EMORY WISHON.....Pacific Gas and Electric Company, San Francisco, Calif.
H. E. YOUNG.....Northern States Power Company, Minneapolis, Minn.

(Terms Expiring 1947)

J. M. BARRY.....Alabama Power Company, Birmingham, Ala.
W. C. BELL.....The United Illuminating Company, New Haven, Conn.
G. A. DAVIS.....Oklahoma Gas and Electric Company, Oklahoma City, Okla.
G. M. GADSBY.....Utah Power & Light Company, Salt Lake City, Utah
R. D. JENNISON.....New York State Electric & Gas Corp., Binghamton, N. Y.
F. C. KELLOGG.....Public Utility Engineering and Service Corp., Chicago, Ill.
G. L. MACGREGOR.....Dallas Power and Light Company, Dallas, Tex.
GROVER C. NEFF.....Wisconsin Power and Light Company, Madison, Wis.
J. H. POLHEMUS.....Portland General Electric Company, Portland, Ore.
P. H. POWERS.....West Penn Power Company, Pittsburgh, Pa.
C. C. SMITH.....Kansas City Power & Light Company, Kansas City, Mo.
FRANK M. WILKES.....Southwestern Gas and Electric Company, Shreveport, La.

(Executive Committee)

The Executive Committee consists of the following members of the Board of Directors: Messrs. W. C. Bell, H. B. Bryans, W. H. Burke, William Kelly, P. H. Powers, W. H. Sammis, E. C. Stone, P. S. Young.